CATALOGUE AND REPORT

OF

OBSTETRICAL AND OTHER INSTRUMENTS

EXHIBITED AT THE CONVERSAZIONE OF THE OBSTETRICAL SOCIETY OF LONDON,

HELD, BY PERMISSION,

AT THE ROYAL COLLEGE OF PHYSICIANS,

MARCH 28TH, 1866.

WITH NUMEROUS ILLUSTRATIONS.

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PREFACE.

The Exhibition of obstetrical and other instruments, which, through the kind permission of the President and Fellows of the Royal College of Physicians, the Obstetrical Society of London was permitted to hold in their Library, will probably form an epoch in the history of Midwifery in this and other countries; for it is no exaggeration to say, with the distinguished surgeon who delivered the last Annual Address in Surgery before the British Medical Association, that it was "one of the most astonishing historical displays of the mechanical appliances of the obstetrical branch of the Art ever collected in one room."

The aim and purpose of this Exhibition were stated in the Annual Address of the President, delivered in January, 1866, in the following words:

"By bringing together the instruments that have been used in different ages and in different countries for the purpose of overcoming those obstetric difficulties which are met with in all ages and all countries, we shall be able to read by these tangible symbols the most important chapter in the history of obstetrics; we shall be able to enter into the thoughts of other men, our predecessors and contemporaries, by studying the visible expressions of their

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minds labouring in the cause of our common science; we shall be able to do something towards identifying and preserving the original forms of instruments as they were designed and used by their inventors. An instrument is not less the offspring of a man's mind than is a book; but the security for preserving an instrument so that it shall, even for a brief time, tell truly the working of the mind that produced it, and continue to answer, in the hands of others, the purpose for which it was designed, is very much less than in the case of a book. Books are at once multiplied, and copies are deposited in libraries, where they are stored for future reference; but instruments are not struck off in numbers from one mould: the first maker follows a model or instructions more or less exactly; subsequent makers may copy the errors and deviations from the original model, taking these errors as essential points; and successive practitioners may contrive endless modifications, so that from a variety of accidents it may, and indeed continually does happen, that the greatest difficulty arises when we attempt to ascertain the right form of an instrument, and to refer a particular discovery to the rightful owner. Considerations such as these suggested to me the idea of instituting this Exhibition."

Invitations for contributions were accordingly sent to distinguished professors and practitioners of obstetrics, and to eminent instrument-makers, at home and abroad. This appeal was responded to with such unparalleled profuseness and liberality, as calls for the most emphatic thanks of the Society.

The Exhibition was inaugurated on the 28th of March, 1866, by a *conversazione*, at which about 600 Fellows of the Society and Visitors, including many eminent foreign physicians, were present.

The interest evinced in the Exhibition, and the desire so generally expressed to possess a permanent record of

the event, have induced the Council to publish this Catalogue in the hope that further service may thus be rendered to obstetric medicine. The opportunity herein afforded of comparing the several varieties of the same instrument, and of reading the description of the modifications adopted by various authorities in different countries in accordance with the variations in their practice, is full of instruction to those who are anxious to perfect the art of Obstetrics. As a work of reference, too, it is thought that this may be of some value to those whose time and opportunities may be too limited to allow of their becoming fully acquainted with the best mode of, and best instrument for, performing any given operation. The permanent utility of such a work will be greatly facilitated if from time to time inventors or modifiers of instruments, and instrument-makers, British and Foreign, will send to the Editor for insertion in future editions, descriptions, and, if possible, illustrations, of any novelty they may have introduced.

The arrangement and classification of the instruments herein adopted, though, perhaps, open to some objection, will nevertheless, it is hoped, be approved by those for whose benefit it is made. It seemed to the Editor above all things desirable that easy reference should be the cardinal feature in the work, and in this he trusts he has succeeded. At first it was thought that it might be well to group together all the instruments used in any given operation; but the practical difficulties of carrying this out were such as to necessitate its abandonment, and led finally to the adoption of the one employed.

The instruments of each kind are all grouped together in their several varieties, and the whole is arranged in alphabetical order. The table of contents will show this at a glance. In one or two instances there is a slight departure from this plan and in favour of the one first proposed, but this

exception was made only on the ground of practical convenience: thus, the instruments used in ovariotomy, in the induction of premature labour, and for the operation of transfusion, &c., are all grouped together, so that the inquirer may see at a glance what are probably the best instruments for either of those operations.

It is, perhaps, well to mention that, for the purpose for which this Catalogue is published, it has not been thought necessary to state that the same instrument was exhibited often by five or six different makers. To a great extent it has been a matter of chance whose name is mentioned as exhibiting any given instrument, which may possibly have been shown by several others. Nothing invidious is intended by this.

In compiling a work of this kind, which represents the joint labours of the Committee appointed by the Council for this purpose, it is almost impossible to avoid a few errors either of omission or commission. It is hoped, however, that these may neither be many nor important, and it will rest with those who discover them to see that they are not repeated, by their kindly taking the trouble to forward without delay to the Editor such corrections as may be required: due attention will be given to these in any future edition.

EDITOR.

53, Berners Street, London, W.
December, 1866.

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A CATALOGUE AND REPORT

OF

OBSTETRICAL AND OTHER INSTRUMENTS,

ETC.

This Catalogue has been compiled by the following gentlemen:—The President, Dr. Barnes; Drs. Greenhalgh, Graily Hewitt, Braxton Hicks, Mr. Gaskoin; and the two Honorary Secretaries, Drs. Meadows and Murray, the former of whom acted as Editor.

CATALOGUE AND REPORT

OF

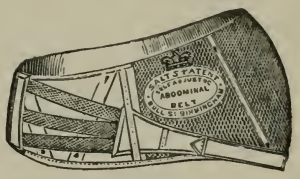
OBSTETRICAL AND OTHER INSTRUMENTS

Exhibited at the Conversazione of the Obstetrical Society of London, held, by permission, at the Royal College of Physicians, March 28th, 1866.

ABDOMINAL BANDAGES, TRUSSES, &c.

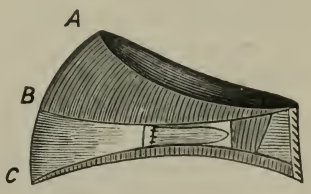
A Belt for use in Pregnancy, Obesity, and Ovarian Disease, was sent by Mr. Salt, of Birmingham, and is figured in this illustration (fig. 1). It accommodates itself to the size of the abdomen, affords support in the upward and therefore right direction, and, from the inclination of the threads of the india-rubber, the support is applied in the same parallel as that of the muscular structures.

Fig. 1.



Two Abdominal Belts were shown by Mr. Salmon, Wigmore Street, one of which is represented in the subjoined sketch (fig. 2). It possesses the advantage of more completely supporting the lower part of the abdomen by means of a pelvic strap, which fastens at the sides over the elastic, and can be secured there in such a way that pressure can be increased at the option of the wearer, thereby

Fig. 2.



attaining more of an upward or lifting support, which is so desirable.

Mr. Pratt, 420, Oxford Street, sent an ABDOMINAL SUPPORT, to which (at the suggestion of Dr. Gueneau de Mussy) he has attached a pair of drawers, in order to avoid the use of understraps in cases where the hips are high and angular; also a belt of calico lined with flannel, for use immediately after the operation of ovariotomy. It has a number of tapes to fasten in front over the wound; can readily be loosened to examine the dressing; and exerts gentle but firm pressure on the walls of the abdomen. It is frequently employed by Mr. Baker Brown.

Mr. Russell, 58, George Street, Portman Square, exhibited a SPIRAL SILK BANDAGE for supporting the abdomen; also a SPIRAL SILK STOCKING; and the OBSTETRIC BANDAGE invented by Dr. Priestley.

A PERINEAL BANDAGE, devised by Dr. Block, was sent by Nyrop, Copenhagen; an ABDOMINAL PAD was exhibited by M. Stillé, of Stockholm; and a COMPRESS FOR ARRESTING UTERINE HÆMORRHAGE, invented in 1847 by Dr. Pretty, was shown by Mr. Coxeter, London. This appliance calls for a further description. It consists of a central pad, attached to two lateral ones, and a band which encircles the abdomen. By means of a screw the compression can be increased or diminished with great facility, and dangerous hæmorrhage may often be thus prevented.

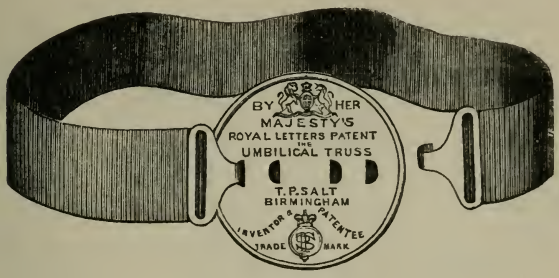
Professor Giordano, Turin, sent a somewhat similar apparatus for the arrest of loss of blood from the uterus. In this instrument the pressure is made on the aorta alone, and can be easily modified.

Mr. Salmon, Wigmore Street, exhibited a BANDAGE FOR UMBILICAL HERNIA, and also some INDIA-RUBBER AIR-PADS for supporting the perinæum; also an OBSTETRIC BINDER, which was originally invented by Dr. Meadows, and modified by Dr. Eastlake.

Dr. Langhardt's UMBILICAL BELT was exhibited by Messrs. Weiss and Son; it is a very ingenious, though somewhat cumbrous, instrument. By a clever mechanical arrangement, the pad is said to remain stationary under all movements of the body, and it has been worn by many patients on the Continent with good result.

Mr. Salt, of Birmingham, sent a Truss for Umbilical Hernia, which is figured in the annexed sketch (fig. 3). The novelty of the invention is the pad. It consists of a circular disc or plate, into which is fastened a facing of soft leather, backed up

Fig. 3.



for solidity by thick paper, to give softness and flexibility to the pad. An india-rubber cap is inserted, having a spiral spring coiled within it, which is intended to retain the bowel within the abdomen. The belt is attached to the pad by means of clasps, which are made to clip the web without stitching, thus reducing the cost and simplifying the apparatus. The ends of these clasps fit into a series of holes in the pad in such a manner as to allow the belt to move without displacing the pad itself. Mr. Salt has modified this belt so as to make it convenient for umbilical hernia in children.

Mr. Pratt also forwarded a Belt for Infantile Umbilical Hernia. The pad is constructed of a series of small water-pads, the pressure exerted by which is said to be continuous and elastic.

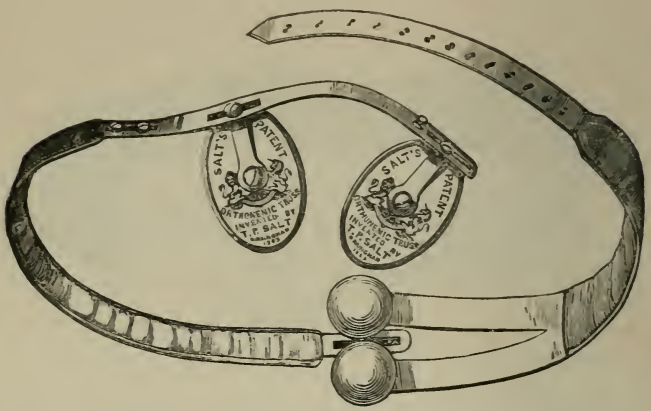
Mr. Pratt's Belt for Umbilical Hernia in the adult is constructed on the same principle.

Mr. Salt, of Birmingham, exhibited a truss which he calls the Orthonemic Truss for Hernia; it is represented in the annexed sketch (fig. 4); was invented and patented by himself; and is said to possess the following advantages:

1. It affords, in addition to the usual inward pressure of

ordinary trusses, a second or upward (lifting) pressure, always required for support of hernia.

Fig. 4.



2. By the peculiar mode in which the vertical or lifting springs are attached to the pads, no displacement of them can take place when once put in position, neither can there be any friction on the skin over the hernial openings.

3. The facility with which the position of the pads may be placed in relation to the median line of the abdomen; and the springs across the abdomen having curves coincident with it, the spring of the truss lies more evenly against the body.

4. The back support consisting of two pads instead of one—one placed above the horizontal line (spring) the other below—gives greater stability to the front part on which the pads are suspended; hence this truss is more likely to remain *in situ*.

5. Every part of the patent truss is made by machinery instead of by hand; so that any portion damaged or soiled can be rectified without the necessity of sending the truss to the instrument-maker.

6. The pads are said to be an improvement upon the fringed edges of ordinary trusses, in which the cushions made by stitching are constantly chafing the skin; but by turning these cushions

into a metallic capsule or clip, the edges and surface of the pads are very smooth and soft.

Dr. Woodward sent his Obstetric Back Supporter. It consists of a padded plate, on the posterior surface of which two springs are hinged, having their common centre formed by a rack-and-pinion hinge, by moving which the springs assume an arched form. To the extremities of the springs is attached a belt which encircles the abdomen; so that, in their effort to take a curved form, force is engendered against the pad forming the centre of the arc, and the requisite amount of pressure is exerted on the surface covered by the pad. Dr. Woodward says that he has used this appliance in a large number of labours, and his patients have expressed themselves as being much relieved by its employment. The specimen exhibited was made by Mr. H. Bigg, Leicester Square.

The Abdominal Belt for use after Delivery, invented by Mr. Toulmin, was exhibited by Maw & Son, London. The abdominal pad is attached to a circular spring, and constitutes an easily applied and effectual support.

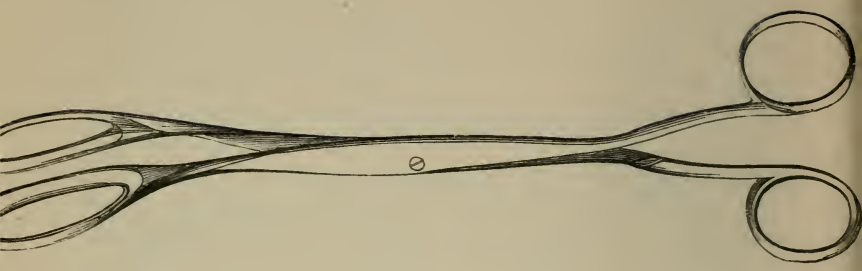
ABORTION INSTRUMENTS FOR REMOVAL OF THE OVUM.

These were of two kinds—1, Forceps; 2, Scoops.

Forceps.—One, exhibited by Dr. Cory, consisted of two fenestrated blades 9 inches long, $2\frac{1}{2}$ inches wide, the handles crossed somewhat, so as to save space. They appeared to be very old, but the authorship was not known.

Dr. Cory also exhibited an Ovum Forceps, of which the accompanying drawing gives a representation (fig. 5); it is about one third the size of the instrument. The blades are fenestrated, curved, and shaped, as is seen, somewhat after the pattern of the ordinary midwifery forceps. The handles being fixed together, the instrument is intended to be passed up into the uterus entire, to seize the ovum or any retained portion, and so effect its extraction.

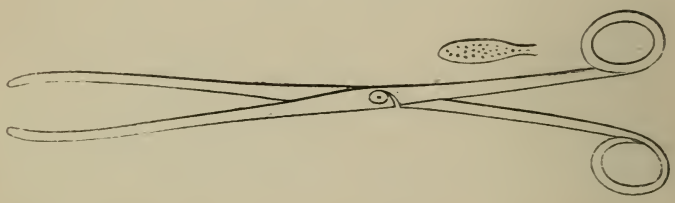
Fig. 5.



Sir James Simpson's Ovum Forceps are about 10 inches long consisting of two portions, which, however, are fastened together like a pair of ordinary scissors. The joint is in about the middle of the instrument; the ends of the blades proper are fenestrated and gently curved, so as to be about $\frac{3}{4}$ inch apart, and they are roughened on the inner surface.

Dr. Radford's Forceps for the removal of the Ovum consists of two blades which are separable (fig. 6). Each blade is $13\frac{3}{8}$ inches long. The handle of each is a circular bow (like those of scissors) rather more than 1 inch in diameter. The shanks from

Fig. 6.



handle to pivot are $4\frac{1}{2}$ inches long, and are at first narrow and thick, but become gradually a little thinner but considerably wider, being about $\frac{1}{2}$ inch. This flattened surface extends on towards the point for about 2 inches, becoming then narrower and round until within an inch of the extremity. It now becomes oblong (joining the blades proper), concave and rough inside (as represented in the sketch), and convex on the outside. The length

from the pivot to the point is $7\frac{2}{8}$ inches. On the flat surface of one blade (the upper) $5\frac{6}{8}$ inches from the handle end, there is a fixed button-headed pivot, and in the other blade there is a retort-shaped notch which admits the pivot, and from its shape the two blades may be securely locked. Although the notched blade lies on and moves upon the other (or pivot) blade, yet by a small contortion made in the shank of the upper blade the points most accurately approximate when closed.

M. Charrière exhibited a pair of Ovum Forceps of Dr. Ward, United States, consisting of a pair of fenestrated blades, one of which was ingeniously made to rotate at the joint, so that it could either fit closely within the other or be exactly opposed to it.

Mr. F. Dunne exhibited a pair of Ovum Forceps. They were made of wood, about 9 inches long, and resembled very much in size, shape, and general appearance, a pair of glove-stretchers; they worked in the same way, by a central spring and pivot. At their extremity were two or three teeth, made by merely sticking in some bits of brass wire, obviously to facilitate the seizing hold of the required object.

Prof. Rizzoli's Ovum Forceps measured $13\frac{1}{2}$ inches in length; they were straight, and fastened like a pair of scissors, the handles locking and unlocking by a pivot lock. The blades proper were $2\frac{1}{2}$ inches long, fenestrated and straight; the handles were of the ordinary scissors kind.

Scoops.—The scoops for the removal of the ovum were of two kinds, and both were exhibited by the inventor, Emeritus Professor Boujalsky, through Professor Hugenberger, of St. Petersburg. The one was made of steel, 12 inches long; the other was a counterpart of this in all except that it was made of boxwood. They were scooped at both extremities.

ANTEVERSION, INSTRUMENTS FOR (see Uterine Supports).

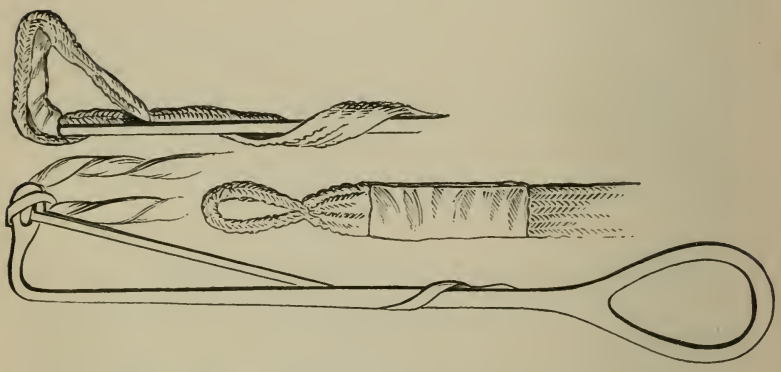
BANDAGES (see Abdominal Bandages, &c.).

BLUNT HOOKS.

The blunt and sharp hooks so frequently used formerly for alteration of the position, or for mutilation, and subsequent extraction of the fœtus, have, since the invention of the forceps, fallen into comparative disuse. The blunt hook is now chiefly had recourse to for facilitating or hastening the passage of the breech, thigh, or arm, when arrested in their progress through the pelvis, or where immediate delivery is demanded. The small number of cases requiring the use of this instrument may, to some extent, account for the few specimens exhibited, and the slight modifications effected in its construction. There are one or two, however, which merit more than a passing notice.

Prof. Lazarewitch's Blunt Hook consists of a straight steel shaft 12 inches in length, the upper part of which, for about 2 inches in length, forms an angle with the shaft of 75°. At the other extremity (handle) is a triangular opening, the base measuring $1\frac{3}{4}$ inches, the two sides each $2\frac{1}{2}$ inches, between which is

Fig. 7.

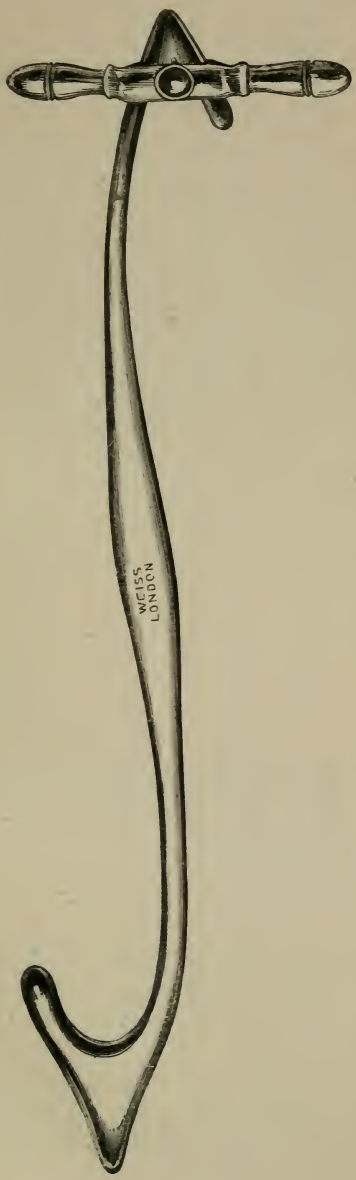


an angle of 50°. The instrument is represented in the above sketch (fig. 7).

No.	Inventor.	Exhibitor.	Length.	Breadth at Extremity.	Shaft.		Handle.	Remarks.
					Straight.	Curved.		
1	—	Ferguson	11¼	1¾	St.	—	Wood, rough, straight	—
2	—	Ferguson	12¼	2	—	C.	Wood, rough, straight	—
3	—	Greenhalgh	12	2	—	C.	Ivory, rough, central, crotchet extremity	—
4	Joorg	Helfer	10½	1½	St.	—	Steel, curved sharp hook	See Joerg's Handbuch
5	Lazarewitch	Lazarewitch	12	2	St.	—	Steel, triangular bow	—
6	Mattei	Mattei	—	—	St.	—	Wood, rough, transverse	Hook at acute angle
7	Newham	Weiss	12	1¾	—	C.	Steel, smooth, transverse, shifting, fixed by screw	'Obstet. Transact.,' vol. vi, p. 8
8	Radford	Radford	12¼	2⅛	St.	—	Semicircular	—

Prof. Lazarewitch claims for his instrument the following advantages:—

Fig. 8.



1st. In extraction of the child by the thigh there is no fear of injury to the genitals, owing to the hook being at a right angle to the shaft instead of being bent downwards in a bow, as in the blunt hook ordinarily in use.

2nd. In extraction the vagina cannot sustain any injury, owing to the rounded extremity of the rectangular hook.

3rd. It may be used for traction upon the neck of the child in its oblique position when decapitation is necessary.

4th. For placing a plaited silk noose over the child's foot, as represented in the drawing.

5th. For returning the funis when prolapsed during labour, which can be effected by a noose made by passing a thin narrow silk tape through the eye in the extremity of the hook. See the drawing (fig. 7).

Mr. Newham's Guide Hook, which is shown in the annexed sketch (fig. 8), consists of a steel shaft somewhat enlarged in the centre, 12 inches in length, curved in the shape of the letter **S**, having at its extremities two simple blunt hooks reversed, one measuring $1\frac{1}{4}$ inches, the other 1 inch in breadth, each with the addition of a prow or guide.

It has a shifting transverse

steel handle which can be attached to either extremity by means of a screw to enable the operator to exert more force where great resistance is encountered. The inventor states that his instrument possesses the following advantages, among others:

1st. That the prows or guides facilitate the introduction of the hooks by their tapering extremities.

2nd. That, in certain cases, the smaller may very advantageously precede the insertion of the larger hook.

Mr. Newham remarks, "It is not intended by this instrument, however, to supersede the use of the ordinary blunt hook, for the blunt hook may be used under circumstances in which it might not be safe to use the guide hook. It is intended to supplement many purposes which the blunt hook is not constructed to carry out."

For further particulars see 'Obstetrical Transactions,' vol. vi, p. 7.

An instrument (inventor unknown) was exhibited by Dr. Greenhalgh for the purpose of passing an extractor over the thighs of the fœtus in cases of presentation where such artificial aid is required.

It consists of a rounded wooden handle 4 inches in length, into which are inserted the two ends of a flexible piece of wire, forming a loop seven inches in length. It is used in the following manner: the looped end of the wires being curved to the extent required are passed over one thigh, until it descends on the side of the opposite one. Half a silk handkerchief or other flexible and soft material is then to be inserted into the wire loop, which should then be retracted, leaving the handkerchief previously detached from the loop for the purpose of extraction.

The advantages claimed for this contrivance are—

1st. Its easy application.

2nd. The firm hold thereby procured on the presenting part.

3rd. The slight risk of damage to the child by the soft textures employed for the purpose of extraction.

Dr. Radford's Blunt Hook. This instrument when complete (with handle described with the Crotchet) is 12¼ in. long. The blade at its handle end is round, and has a rim in which there is a notch to receive the small lever-stop, and the same mechanism for adjusting the handle as the crotchet. The blade becomes thinner and wider (nearly ⅝ in.) as it passes towards the bend; which makes a kind of hook forming a small segment of a

circle whose diameter is $2\frac{1}{8}$ in. Its surface is flat, and it is well rounded off at the edges. This instrument is easily passed over the thigh of the infant, causing less injurious pressure than the ordinary blunt hook.

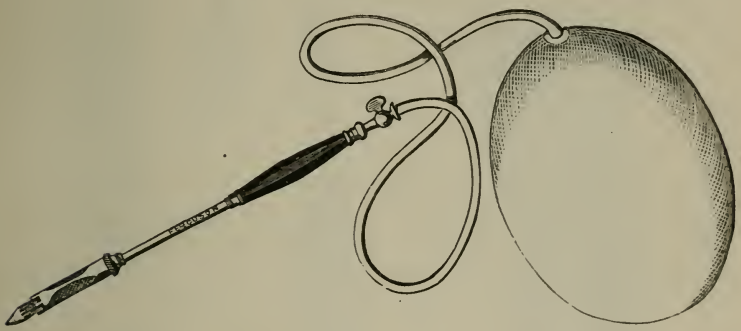
Dr. Oldham's VERTEBRAL HOOK. Specimens were exhibited by Durroch and Coxeter. It consists of a long fine stem bent at an acute angle at the end to form a hook, designed to take hold, in the foramen magnum, in cases where the cranium is too much broken up to afford a sufficient hold to the crotchet or craniotomy forceps. It is figured in Churchill's 'Theory and Practice of Midwifery,' 3rd edition, 1855.

The SHARP AND BLUNT HOOKS of Professor Martin, of Berlin, were exhibited by Lütter. These are figured in 'Martin's Hand Atlas.'

CAUTERISERS AND CAUSTIC HOLDERS.

Professor Nélaton's Gas Cautery was exhibited by Mr. Ferguson, and is represented in the subjoined sketch, fig. 9. It consists of a small india-rubber bag which is to be filled with gas; from this proceeds a small elastic tube about a yard or so long, to the end of which is attached the cautery, a stop-cock being placed so as to regulate the amount of gas going to the latter. The cautery itself consists of a small tube of fine wire gauze about an inch long and a quarter of an inch in

Fig. 9.



diameter. This is fixed at the end of a tubular handle 8 or 9 inches long. When in use, the gas issues at the gauze end, where it is consumed; the gauze ensures perfect combustion and consequently great heat, which can be maintained for as long a time as the gas in the bag takes to consume.

Galvanic Cautery.—This instrument was invented by the exhibitor, Mr. Robert Ellis, in 1852, an account of it being then published with a number of cases of uterine diseases in which it was successfully used. It was subsequently much improved, and brought by the exhibitor to its present condition, and as such was exhibited before the Obstetrical Society, and fully engraved and described in the 'Transactions' for 1862. Its peculiarity resides—1st in the extraordinary activity and intensity of the battery, which with only a single cell is capable of igniting a considerable length of platinum wire; and 2nd, in the peculiar arrangement, by which the heat thus developed is accumulated and applied to the diseased surface.

A similar instrument was exhibited by Coxeter for use in operations for vesico-vaginal fistula.

Mr. Ellis also showed his PERFORATED CAUSTIC AND CAUSTIC

FIG. 10.

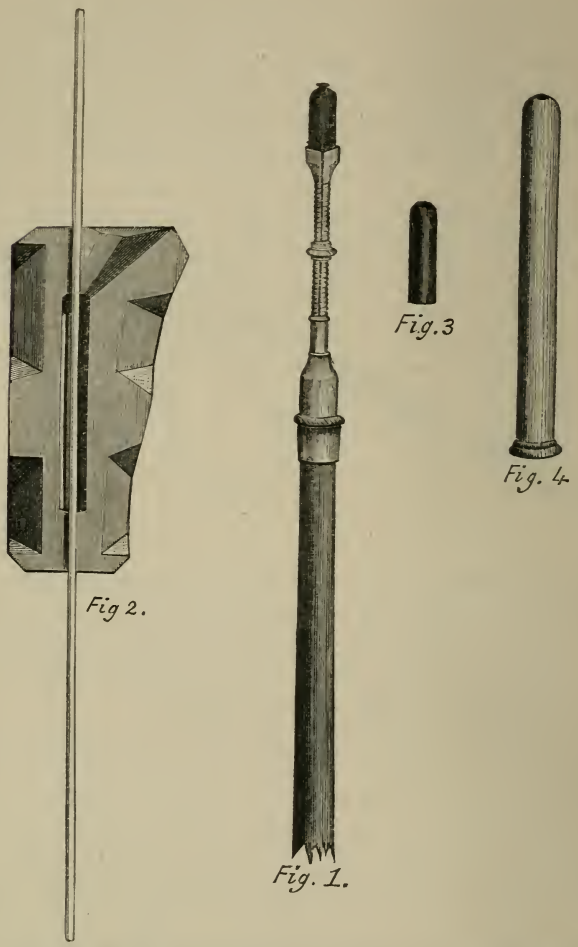


Fig. 1 represents the caustic holder mounted on a quill, and fitted with perforated caustic.

Fig. 2 shows the mould for the caustic, in section, with the steel wire which forms the core.

Fig. 3, a piece of perforated caustic.

Fig. 4, the cover with the aperture at its end.

Holder.—This invention was exhibited at the Western Medical Society twelve years ago. The caustic then was in the shape of bullets, perforated through the centre and held in place by a platinum pin. In May 7th, 1862, the present form of cylindrical perforated caustic was shown to the Obstetrical Society, with the peculiar holder since known by the exhibitor's name. The instrument is represented in the foregoing sketch (fig. 10).

The simple idea of the instrument is the solid and unyielding support given to the brittle caustic by passing a metallic pin through the centre of the cylinder. To effect this the caustic must be cast hollow, and this is accomplished by means of the mould (fig. 2). The central perforation is made by passing a polished steel pin through a hole in the upper and lower halves of the mould, and the fused caustic is then poured into the mould. On solidifying, the pin is easily withdrawn, and a hollow stick is produced.

The caustic holder consists of a small socket of silver bisected and carried on the halves of a slender metallic support, grooved internally, and externally cut to a spiral thread, in which a nut works to and fro. The cylinder of caustic drops into the socket, and a platinum pin is passed through it and between the halves of the stem. The whole thing is fixed in position by the little nut which works upwards. The stalk of the instrument is of porcupine quill, and the cover (fig. 4) is perforated at its end for the purpose of keeping the caustic always dry and hard.

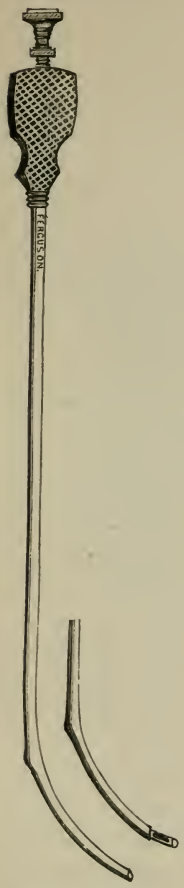
Dr. Marion Sims' Caustic Holder was exhibited by Messrs. Mayer and Meltzer: it consists of a pair of long forceps with sliding spring, the ends of the forceps being hollowed so that when closed they form a tube which carries the caustic.

A Porte Caustique of M. Stillé, of Stockholm, was exhibited by the maker. The caustic was carried, as it were, in a catheter, having one side open for a short space at its extremity, and by a screw at the handle the open side containing the caustic could be rotated so that the caustic presented itself at every part of its revolution.

A somewhat similar instrument for liquid caustics was exhibited by the same maker. It carried a small roll of sponge at the end, which could be saturated with the solution of any given caustic; by pressing the stilet the fluid exuded through the perforations at the extremity.

Sir J. Simpson's Caustic Holder for use without the speculum was exhibited by Mr. Ferguson. This instrument in principle resembles the *Porte Caustique* above described; it is represented in the annexed sketch (fig. 11). When closed it resembles the ordinary uterine sound, and as such may be passed up to the cervix or other part intended to be cauterised. By turning the screw at the handle the caustic is pushed out and rotated.

Fig. 11.



Simpson's Porte Caustique.

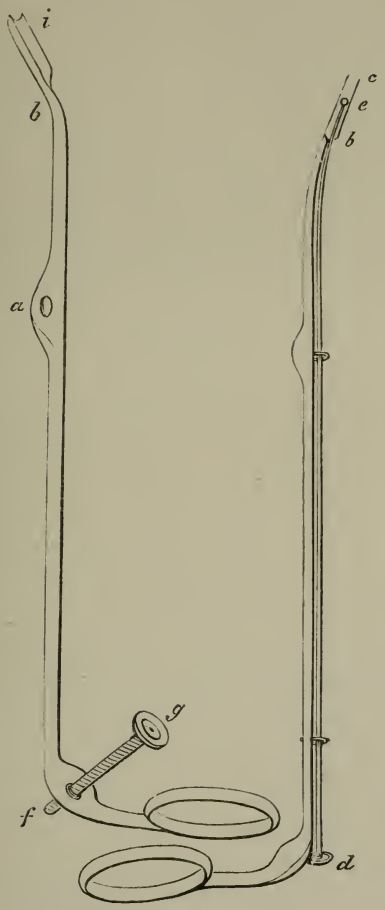
Dr. Savage showed a pair of Curved Forceps, forming, when closed, a *receptacle for caustics*, to be introduced within the uterus as well as for ordinary application. The two small apertures correspond with the trunnion pins of various lancets, knives, &c., securing firmness as well as great portability.

Dr. Routh sent his Instrument for introducing Caustic in Utero, or for dilating the internal os, manufactured by Coxeter.

This instrument, which is represented in the following illustration (fig. 12), consists of four parts, two blades, a piston, and a screw. The blades are kept together as scissors by a central pin (*a*). The upper portion (*b*, *c*) is curved like a Simpson's sound. The extreme end for about one inch being grooved so as to receive a small thin stick of caustic about one line thick. Between these two blades is a piston which fits into this groove (*e*), the handle of which (*d*) slips up or down in two eyes or staples in one of the handles. By pressing the end of the piston (*d*), or drawing it downwards, it is made to work in the groove. Thus if the end of the piston is at *b*, on pushing it forwards, at the same time as the blades are drawn out, the caustic remains in utero. By means of the screw at the distal end (*f*, *g*), the blades are made to

open at the uterine end, and so the uterine internal os may be dilated.

Fig. 12.



CEPHALOTRIBES.

The earliest instrument designed for crushing the bones of the fœtal skull appears to have been the "Compressor Forceps" (*nuovo forcipe compressore*) of Assalini. This instrument formed one of the collection submitted to the Institut National de France in 1810, and is described in Assalini's 'Nuovi Stromenti, &c.,' Milano, 1811. It was designed by him to overcome the cases of the second order of difficulty, those, namely, in which the conjugate diameter was much under 3 inches or in which the head was left behind after the detachment of the body. He used it to crush the base of the skull and the face, and relates cases of successful use.

Fig. 13.

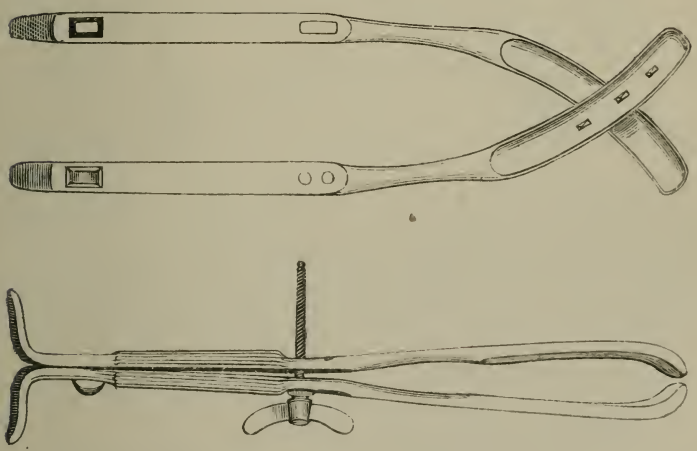
Assalini's Cephalotribe.

Like his forceps, modelled after Palfyn's idea of bringing two levers into opposition, the blades do not cross. They are powerful bars, slightly curved to grasp the head, and are held together at the ends of the handles, like his forceps. The crushing force is effected by acting upon the middle of the blades; the fulcrum or centre upon which the arms move being the joint at the proximal end of the handles.

The instrument most nearly resembling the original compressor-forceps of Assalini is the Cephalotribe of Professor Lazarewitch, of Charkoff, Honorary Fellow of our Society. This instrument has a full pelvic curve in the blades. These are scooped out on the inner sides, and are armed with three strong pyramidal projections springing from the hollow of the blades, and ending in points which look towards the handles. These are calculated to help in breaking down the bones and also in

securing a hold for traction. When closed the blades are $\frac{1}{8}$ths of an inch apart in the middle; the extreme ends curve inwards so as to touch. This distance then marks the limit to which compression can be carried. The blades are 9·50 inches long. The shanks then run parallel to the handles, which turn off at right angles; the shanks are 6·50 inches long; they are united near the handles by a stout flat bar projecting from one shank which slips through a slit in the other. This arrangement is known as Assalini's lock. This point of union forms the fulcrum or centre upon which the two arms work. The compressive force is applied by a screw which is carried through the shanks near their junction with the blades. The blades are long enough to carry the screw a sufficient distance from the vulva to obviate inconvenience in working. The blades are introduced separately, and, being little more than an inch wide, are easy of application. The instrument was one of the lightest exhibited, and of the most simple construction; it weighs only 2 lb. The principal points of the instrument as regards lock, &c., may be seen by referring to this drawing.

Fig. 14.

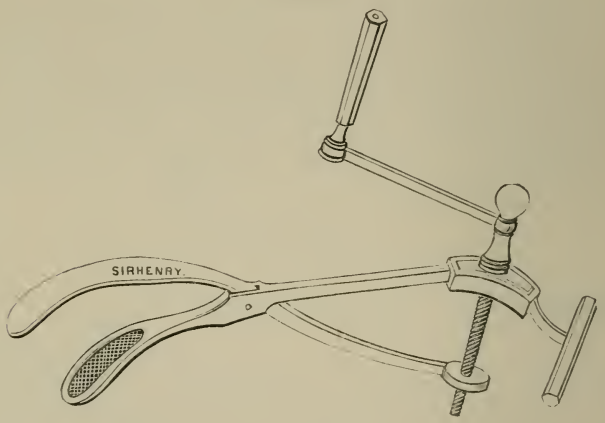


The instrument exhibited by Professor Lazarewitch has been presented to the Society by Dr. Barnes, President.

The model of all the modern cephalotribes, excepting that of Lazarewitch, is found in the instrument of Baudelocque (fig. 15). The original instrument, designed, and described to the French Academy in 1833, and used by the illustrious French obstetrician, was presented to the Obstetrical Society of London by Madame Petitjean, who inherited it from the inventor. This interesting gift was made through the intervention of Sir Charles Locock, our Honorary President.

The extreme length is 21 inches, the length of the blades, measured from the lock, is 9·75 inches. The lock resembles the French forceps-lock. The compressive force is obtained by a

Fig. 15.



travelling-screw which runs in a female-screw in the left handle and through an oblong slit in the right handle. The screw is worked by a winch-handle (manivelle). The blades are slightly curved, being 1·25 inches apart at the greatest distance, and touching when closed at the points. The points are smoothly rounded. The inner surface of the blades is scooped out into a shallow smooth concavity. The blades widen gradually from the lock towards the ends, being 1·50 inches wide near the ends. The blades have a considerable curve. The weight is 4½ lbs.

A modification of Baudelocque's instrument, by Luer, was exhibited by Luer, of Paris.

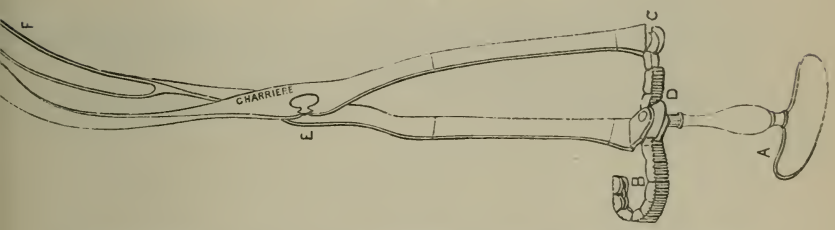
The Cephalotribe of Professor Depaul, Honorary Fellow of

our Society, was exhibited by Sir James Simpson, made by Mathieu, of Paris. This is a massive instrument, measuring 24 inches in length. It is fitted with the French forceps-lock. The blades have a considerable pelvic curve, are a little more than an inch wide, without fenestra. The inner surface of the blades is studded near the end with small projecting teeth, to improve the grasp upon the head, and the ends are curved inwards to form crotchets, which, meeting when the blades are fully closed, leave a space of half an inch between the blades.

The instrument is worked by a chain fixed to the left handle, which is wound up on a drum on the right handle, and is turned by a double lever. The power is indeed that of the winch.

Another specimen of Depaul's instrument, of later date than the preceding and modified, was exhibited by Charrière, of Paris. It is figured in the annexed illustration (fig. 16). This specimen

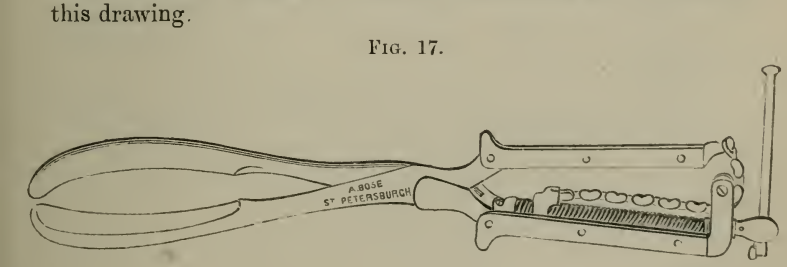
Fig. 16.



is described as the Céphalotribe à crémaillère. It has the crotchets at the end of the blades, and, in addition, is furnished with the detaching-joints of Charrière. The handles are brought together by a jointed chain fixed to the right handle, which is worked by a cog-wheel.

Etlinger and Hugenberger's Cephalotribe, a modification of Baudelocque's, was exhibited by Professor Hugenberger, of St. Petersburg, Honorary Fellow of our Society, and is shown in this drawing.

Fig. 17.



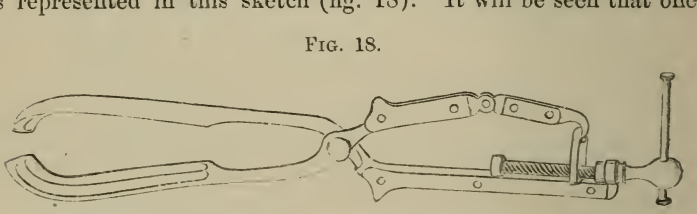
The modification consists in the instrument being made lighter and shorter than Baudelocque's, yet retaining its strength. The weight is 3 lb. 4 oz., the length is 20·50 inches; Baudelocque's is 21 inches. The blades also have a greater pelvic curve, they are narrower, so that they can be introduced more easily, and meet more closely; they have Busch's lock. The right handle has Braun's hook; the inner part of the left handle is supplied with a screw to bring the handles together.

The KEPHALOTRYPTOR of Professor Ed. MARTIN, of Berlin, was exhibited by the inventor, and is figured in Martin's hand atlas. The length is nearly 24 inches. It has a considerable pelvic curve. The blades are curved inwards at the ends so as to meet. The distance between the blades when thus closed is 1·75 inches. The lock is like the English forceps-lock, and just below the lock, on each handle, is a shoulder or rest for the fingers to aid in extraction.

The instrument is worked by a powerful screw running through both handles, and turned by a double lever. It was exhibited by LÜTTER, of Berlin.

The CEPHALOTRIBE of BRAUN, of Vienna, exhibited by WEISS, is represented in this sketch (fig. 18). It will be seen that one

FIG. 18.



of the handles is divided into two by a jointed portion, provided with a hook, which fixes on a sort of movable cross-bar attached to a screw which works on the inner side of the other handle. By turning the screw with the cross handle at the end of the instrument the cross-bar is pulled up or down, and this, acting upon the jointed portion of the opposite handle, opens or closes the blades.

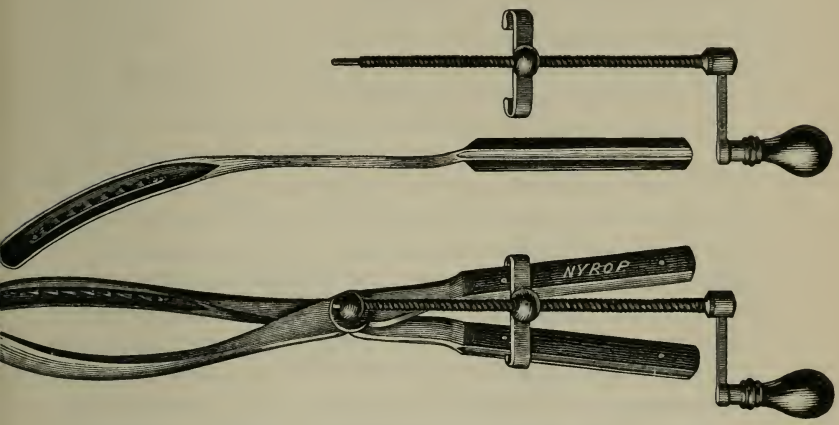
Another specimen of BRAUN'S CEPHALOTRIBE was exhibited by STILLE, of Stockholm.

The CEPHALOTRIBE modified by CAMILLUS NYROP, of Copenhagen, date 1866, was exhibited by C. NYROP.

The handles are brought together by means of a screw, which

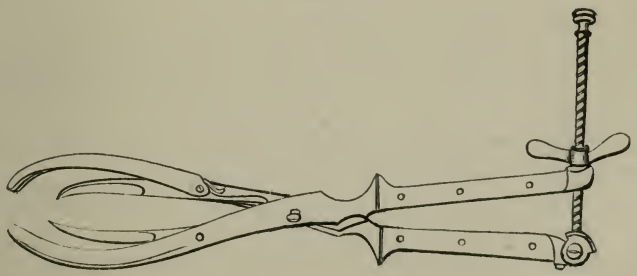
travels up and down on a shaft in a groove between the handles, so as to approximate the blades and crush the fœtal head. The blades are curved, grooved on their fœtal aspect, and a row of teeth are placed along the centre of the groove. The lock is of the ordinary pivot or button form; the blades cross. This instrument is represented in fig. 19.

Fig. 19.



Professor Cohen's Cephalotribe presents this peculiarity, that in addition to its power as a crushing instrument each blade is armed with a cutting blade, by means of which the head is, as it were, bisected. This, no doubt, greatly facilitates the after crushing, and enables the instrument to be of a lighter description. Fig. 20 represents this instrument.

Fig. 20.



The Cephalotribe of Professor Rizzoli, described in Rizzoli's work 'Instrumenti d'Ostetricia,' Bologna, 1856, was exhibited and presented to the Society by Professor Rizzoli, Honorary Fellow of our Society.

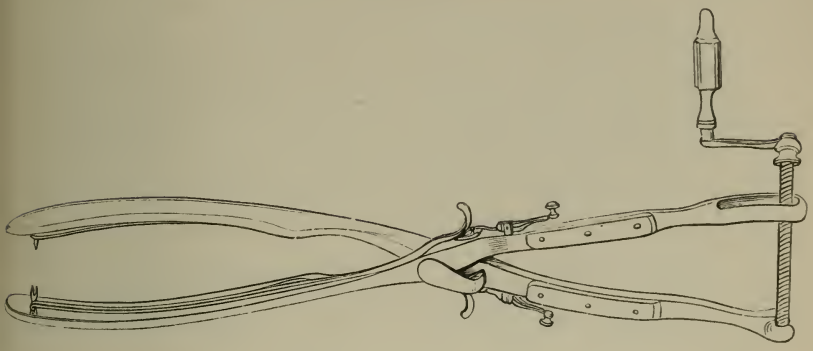
The general construction is after the model of Baudelocque's instrument, but it is much improved in lightness and neatness. The length is 19·50 inches; the length of the blades from the lock is 9·50 inches. The lock is the French forceps-lock, but differs from Baudelocque's in this, that the fulcrum is formed by a screw which serves to fix the blades when adjusted. The handles, being 10 inches long, are flat bars brought one over the other when the blades are closed, thus forming very powerful levers. They are brought together by a screw worked by a winch, so far like Baudelocque's, but differing in this, that instead of a simple oblong slit in the right handle, Rizzoli's right handle is an open fork, so as to admit of the screw revolving on a joint which fixes it to the left handle. This arrangement offers a great convenience in packing the instrument, and also in adjusting the screw for work. The blades have a more moderate pelvic curve than Baudelocque's or than most other French cephalotribes, but in other respects resemble Baudelocque's. They are lighter and narrower. When closed the points touch, and the extreme width between the edges of the blades is barely ·50 inch. The blades are, however, deeply concave; the concavities are smooth. The effect of the narrowing of the blades, and the deep concavity, is to make the edges prominent and sharp, so that these would easily break into the skull as the blades are closed. The weight is 3 lb. 9 oz., which is very considerably below that of its prototype, the original instrument of Baudelocque; at the same time it is a powerful weapon, quite if not more than sufficiently strong to crush the head of any fœtus, and the close approximation of the blades secures a complete reduction of the cranial dimensions.

The Kephalotryptor of Professor Hennig, of Leipzig, date 1865, was exhibited by the inventor.

This instrument is designated the Kephalotryptor à crochets. It is armed with hooks or crotchets in order to grasp the head more firmly and to facilitate extraction after crushing. The

crotchets (vide fig. 21) if not needed may lie guarded or concealed. The hooks also serve as handles in extraction. When wanted

Fig. 21.



to seize the head the crotchets are started out by pressing upon the handle and then pulling the hook down. By a reverse manœuvre the head can be set free from the hooks.

Professor Hennig's instrument works with a screw running through the ends of both handles, and turned by a winch, like Baudelocque's original instrument. The total length is 24 inches. It is very massive.

The specimen exhibited is in the Museum of the Society, presented by Dr. Hennig.

The Cephalotribe of Scanzoni, Honorary Fellow of our Society, was exhibited by Sir James Simpson. Length about 21 inches. The blades articulate by a Brünninghausen's lock. The blades are without fenestra, have a moderate pelvic curve, meet at the end, and leave a maximum distance of an inch and a half. The inner surface of the blades is slightly concave, and has a ridge running down the middle. Just below the lock the handles are furnished with shoulders to facilitate manipulation. The compressive force is obtained by a peculiar mechanism: a bar travels over both handles. When the handles and therefore the blades are open or divergent, the travelling bar runs up towards the lock. As the bar is made to travel downwards towards the diverging ends of the handles these are brought together. This movement is effected by a screw fixed to the inner aspect of the left handle, and running parallel with this handle through the

middle part of the bar. The screw turned by a double lever brings down the travelling bar and thus draws the handles together.

The Cephalotribe of Kilian, of Bonn, was exhibited by Sir James Simpson.

This is a massive instrument, resembling generally that of Baudelocque's. Its length is 25 inches. The blades articulate by the French forceps-lock. The compressive force is obtained by a toothed and graduated bar, forming the segment of a circle, fixed to the extreme end of the left handle and travelling through a slit in the right handle by means of a cog-wheel worked by a winch.

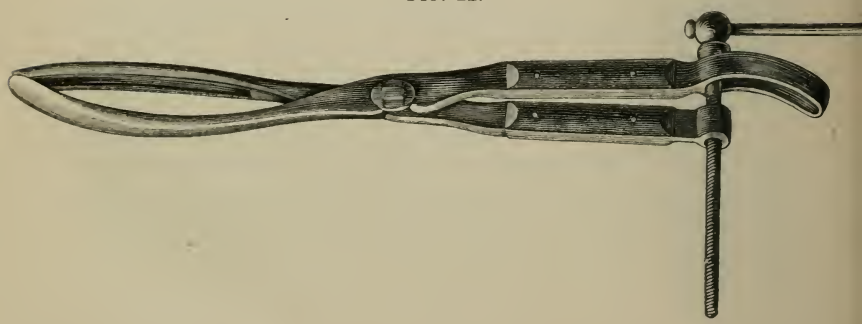
The Cephalotribe of Sir James Simpson, Honorary Fellow of our Society, was exhibited by Young, of Edinburgh, for Sir James Simpson.

This instrument is the lightest and smallest of all the cephalotribes, without being deficient in power. The length is about 14½ inches; the blades have a slight pelvic curve; the union is by the English forceps-lock; the blades are nearly parallel, but curved at the ends, so that they touch; the extreme distance between the blades is about 1¼ inch, they are rough on the inner surface. The compressive force is effected by a screw running through both handles, near the ends, worked by a fly-nut.

Dr. Schöller's Cephalotribe.

This is a massive powerful instrument, generally resembling Baudelocque's. It is worked by a screw running through the handle-ends, and turned by a bar-lever. It was exhibited by Prof. Nyrop, of Copenhagen, and is represented in this sketch.

Fig. 22.



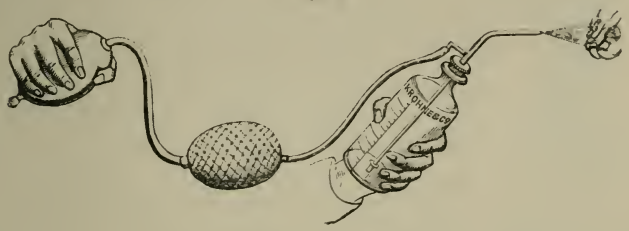
CHLOROFORM INHALERS, &c.

Dr. Richardson exhibited his

ANÆSTHETIC SPRAY PRODUCER.

This apparatus consists of a bottle for holding the volatile fluid, of a special tube through which the fluid must be passed to be distributed or pulverized, and of a small pair of hand or foot bellows for the dispersion of the fluid from the tube, as is shown in this sketch (fig. 23).

FIG. 23.



In preparing to use the apparatus, first charge the bottle with the volatile fluid. Next connect the spray-producing tube with the bellows. Lastly, insert the spray tube firmly into the bottle.

The bellows are to be firmly worked at the rate of one stroke per second. The second bulb of the bellows, surrounded by silk network, will soon become distended so as to sustain the pressure, and a fine spray of ether will escape from the end of the spray tube.

In putting together the apparatus, it is necessary to see that the connections between the tube and the bottle, and between the bellows and the tube, are perfect.

The spray thus produced when it is directed upon the body causes the insensibility.

The free end of the tube through which the spray is delivered may be quite plain, or may be furnished with a cap, which is removable at pleasure. When the cap is removed, the capillary tube conveying the fluid will be found in the centre of the outer casing or tube, and in it a needle. This needle regulates the supply of ether, and needles of two sizes are sent with each apparatus. If the operation to be performed is very small, the large needle is to be inserted, by which the spray is rendered extremely

fine. If the operation is larger, the smaller needle is inserted, and a freer spray is secured. In some cases the needles may be removed altogether, when, if the instrument acts well, a very large rush of spray may be obtained.

Special Apparatus.—For small operations and for ordinary use, the single jet above described is employed; but Dr. Richardson has added other tubes for special purposes, which he thus describes:

Fig. 24.

In the Double Converging Jet (fig. 24) the jets terminate in two points, curved towards each other, the currents of spray crossing about an inch from the points of the jets. This tube is used especially for the extraction of teeth. When the spray from it is to be directed on one point, it should fall on the part about the eighth of an inch beyond the line where the currents cross. If it be necessary to narcotize two points, the spray should be directed about a quarter of an inch within the line where the currents cross, or about a quarter of an inch, or from that to half an inch, beyond.

Fig. 25.

In the Multiple Spray Tube the spray is delivered from three or more parallel jets. This tube is used in cases where a surface of from two to three inches requires to be narcotized; and, also, where a moderate degree of insensibility has to be induced over a very large surface, as in lumbago.

The Probe Spray Tube is made like a common probe; it delivers a fine spray, and is useful whenever the spray requires to be directed into a sinus or cavity.

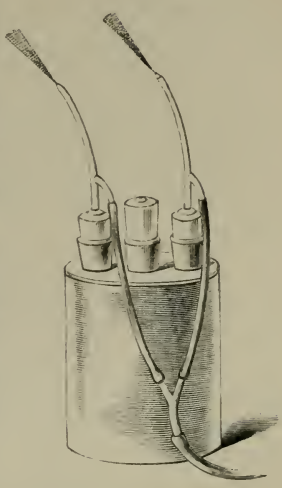
The Lateral Spray Tube is closed at the extreme end, but has from one to three openings in the side, near to the end. It is used in cases where a side spray is necessary.

The Straight or Uterine Spray Tube (fig. 25) is perforated in one, two, or three places at the point. It is intended for directing the spray deeply into cavities of the body.

Where a surface of skin several inches long has to be divided, *a large double or triple jet* must be

employed. The jets may be inserted into a three-necked metal bottle charged with eight or ten ounces of ether, as shown in the diagram (fig. 26). With an apparatus constructed in this manner, sufficient insensibility may be produced in forty-five seconds to enable the operator to perform capital operations painlessly.

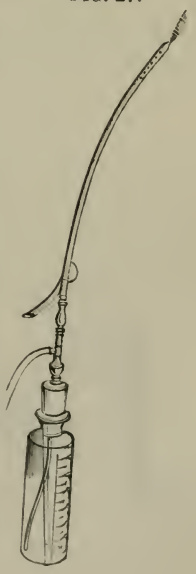
Fig. 26.



Another instrument on a similar plan has been constructed for large operations, using two bottles instead of one, and bringing them together in a small leathern case. Covered with felt, it retains the ether or other volatile fluid when not required for immediate use.

The Spray Catheter (fig. 27) is a tube made like a female catheter, and is used for injecting narcotic spray into the bladder or any sac. The spray is delivered without subjecting the part into which it is dispersed to any pressure from distension.

Fig. 27.



These instruments were all made for Dr. Richardson by Messrs. Krohne and Sesemann, of 241, Whitechapel Road.

Dr. Richardson insists on the necessity of having pure ether, which should have a sp. gr. of ·723. It should boil in the palm of the hand. Taken on the tongue, it should evaporate at once, leaving no sensation whatever except that of slight coldness. Directed as a spray on the bulb of a thermometer, it should bring the mercury down six degrees below zero Fahr.

Messrs. Garden and Robbins, of Oxford Street, are mentioned as selling ether of the requisite purity, some of which they exhibited. They also exhibited samples of three other preparations of ether introduced by Dr. Richardson, viz.—

I. Iodized Ethereal Oil.

This preparation is composed of iodine, absolute ether, and pure oil. It is said to form a good dressing for recent wounds or incisions, but is especially applicable for suppurating or open surfaces in which there is a fœtid discharge. It may be applied directly by a camel-hair pencil. Lint saturated with this solution and applied to the affected surface, if excluded from the air, does not adhere, and may be readily removed without giving pain.

II. Ozonic Ether.

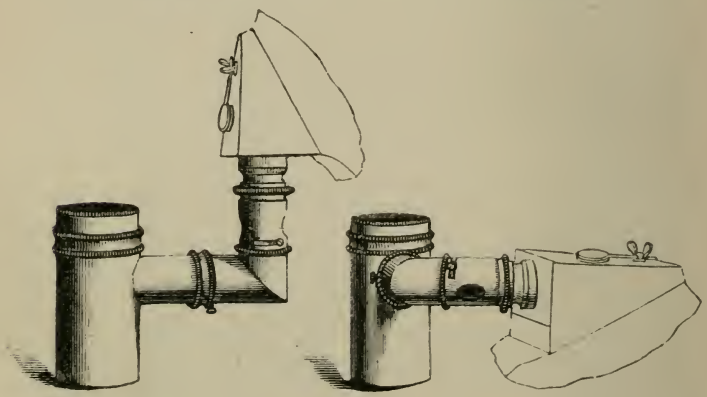
This ether contains ozone, and diffused from a spray tube in the sick-room, or allowed to evaporate from a linen cloth, rapidly fixes ammoniacal compounds and deodorizes the air. It may also be inhaled from a pocket-handkerchief in quantities of one or two teaspoonfuls, in cases where the medical practitioner sees its applicability.

III. Xylo-Styptic Ether.

This ether is to be used with a spray tube, so as to combine the effects of the styptic with the constringent influence of extreme cold. The spray produces most rapid congelation, even of defibrinated blood. It also arrests decomposition of blood.

Dr. Sansom exhibited his Chloroform-Inhaler which is represented in the subjoined illustrations (figs. 28, 29).

Fig. 28. Fig. 29.



Sitting Position. Recumbent.

This instrument is so constructed as to cause not only a due dilution of the chloroform-vapour with air, but also a gradual increase in the proportion of the former from the commencement of the inhalation until the attainment of anæsthesia: it thus induces a tolerance of chloroform.

Mode of Use.—A drachm of chloroform is poured upon blotting-paper loosely placed in the receptacle; an interstratum of *gutta percha* prevents undue cold during vaporisation; by means of a joint in the horizontal tube the receptacle can be kept in the upright position, however the patient may be placed; moreover, the whole instrument revolving on the mouthpiece, it not only adapts itself to any position of the face, but it can be turned from one side to the other to suit the convenience of the surgeon.

At the commencement of the inhalation, the valve of the face-piece is turned off, and the apertures in the tube next to the facepiece are left perfectly free to the air; after two or three inspirations in this condition, wherein the chloroform is necessarily very highly diluted, the outer tube is gradually turned so as to occlude the apertures of the inner one; then the valve of the facepiece is also gradually turned so as to cover its aperture.

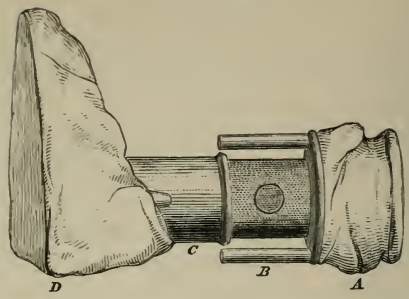
By these means a gradually increasing proportion of chloroform is inhaled, the patient is rendered tolerant of the vapour, and narcotism is attained without discomfort or danger.

The instrument is very portable, and is half the price of the inhalers now in use. It is made by Matthews, of Portugal Street.

Dr. Sansom also showed his Chloroform Inhaler for Obstetric Purposes.—The instrument just described succeeds very well in the production of anæsthesia during natural labour, and for the performance of obstetric operations. By keeping the apertures of the exit-tube more or less closed, any dose or proportion of chloroform vapour may be administered according as the pains or other circumstances require. The following modification of the inhaler is, however, from its portability as well as efficiency, more useful for obstetric purposes (fig. 30).

As will be seen by the diagram, the whole instrument is constructed to close like a telescope, so as to occupy the least possible space. A is a reservoir constructed of silk and flannel, and containing a surface of cambric on which the chloroform is poured. B is a tube of perforated metal, which, by being pushed more or

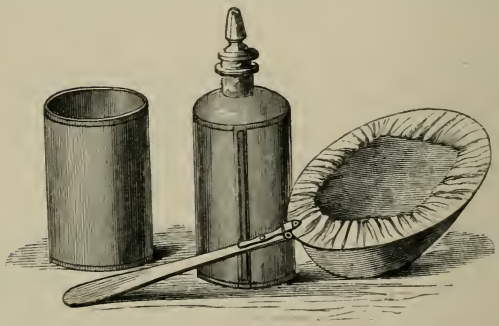
Fig. 30.



less into the tube C, regulates the admission of air, and consequently the dilution of the chloroform vapour. D is the face-piece. In the course of a confinement, the medical attendant having previously arranged the tube B so as to administer the proportion of chloroform which he requires, the patient can herself with the greatest ease apply the inhaler, or this duty may be delegated to the nurse.

The subjoined sketch (fig. 31) represents, in miniature, Dr. Skinner's Apparatus for what he describes as the more safe, effectual, and economical administration of chloroform, which he thus mentions:—

Fig. 31.



"For all that I know, the means may be nothing new, but they suggested themselves to me late in December, 1861, on hearing of the method introduced by Sir James Simpson, of administering chloroform by drops on a muslin or cambric handkerchief; which method, however advantageous, is subject to two objections,

namely, (1) The difficulty of dropping the chloroform and of seeing where you are dropping it; and (2) The difficulty of protecting the patient's face from being irritated by the anæsthetic, even by inunction with olive oil. This inhaling apparatus the author believes will not only obviate those inconveniences, but render the inhalation of chloroform less dangerous and more effectual in smaller quantities, and be consequently more economical.

By the old method, when the labour-pains were severe, as as much as one and a half fluid ounces an hour were often used; whereas with this inhaler and drop-tube the operator can easily anæsthetize a case of labour at the rate of half an ounce an hour, which is equal to a saving of about *sixty-five per cent. of chloroform;* no small consideration. For the last five years Dr. Skinner has never used any other than *methylated* chloroform, which he finds to be quite equal to that prepared from the best rectified spirit, thereby the practice of anæsthetic midwifery is still further economised; and the quantity of chloroform consumed may be still further lessened by withdrawing the inhaler at every expiration of the patient.

The apparatus is composed of a mask or inhaler for receiving and evaporating the chloroform, and a bottle with a peculiar form of drop-tube attached, which is called the magazine regulator.

Description.—The framework of the mask is of tinned iron or German silver, or silver-plated wire. It somewhat resembles a fencing mask, excepting that it is covered with fine domette or Welsh flannel instead of wire gauze, and that it covers only the lower half of the face. For convenience, it has a movable handle, and is otherwise made to fold up so that it may be carried in the pocket, hat, or case. A form of the inhaler has lately been constructed by the original makers at the author's suggestion, *for especial use in hospital practice,* which does not fold up. As a natural consequence, though not so portable, it is both stronger, more durable, and cheaper than the one just described.

The drop-tube is a tube of glass or metal, about one and a half inches long, and so far sealed at one extremity that a silver wire ligature only can pass; it is then thrust through a perforated cork which is inserted into a four-ounce phial of green or

blue glass, and the magazine-regulator is ready for use. The cork is more durable if covered with white kid leather. Messrs. Maw and Son have greatly improved this drop-tube by making it and the stopper one, and *entirely of glass*, as represented in the woodcut.

On inverting the magazine-regulator with chloroform in it, at no single inversion can more than thirty minims escape until it is reinverted. The principle of this invention is, that no more liquid can flow at one inversion than is sufficient to allow the atmospheric pressure to balance the elastic force of the vapour of chloroform and air within the bottle. It might be called a pneumato-hydraulic regulator of chloroform. As the apparatus is free from mechanical valves, sliding tubes, and other unnecessary and dangerous complications, it is safer to use and less liable to get out of order than other forms of chloroform-inhalers.

Directions for Adjusting.—1. Examine well the bearings of the mask or inhaler before attempting to adjust it.

2. Be careful not to apply much force in the adjustment, as scarcely any is required.

3. Adjust the domette or flannel cover by passing the handle of the inhaler through the slit up to the hinge; then draw the india-rubber opening over the wire frame, keeping the side on which the facial or horizontal wire is, looking upwards.

4. Adjust the horizontal or facial wire (under the domette), and keep it in position until you have unfolded the handle. See that the small notch in the hinge extremity of the handle receives the facial wire, and fixes it; then turn the instrument over, and fix the nut or bolt beneath the handle.

N.B. There are two covers with each instrument. When soiled, or, indeed, after administering chloroform to any patient, *a fresh cover should always be put on*, and the one used should be washed with soap and *cold* water, and dried unstretched in a dry atmosphere or in a draught of cool air. The washing need only occupy a few seconds.

Directions for Using.—1. Never charge the bottle with over three fluid ounces of chloroform, namely, to the top of the tell-tale or slit in the leather cover; otherwise the contents will not flow freely enough when wanted.

2. In adjusting the tubular stopper, see that it is firmly "sent home" with a turn, so that there will be no likelihood of its

falling out during use—an accident which hitherto has not happened.

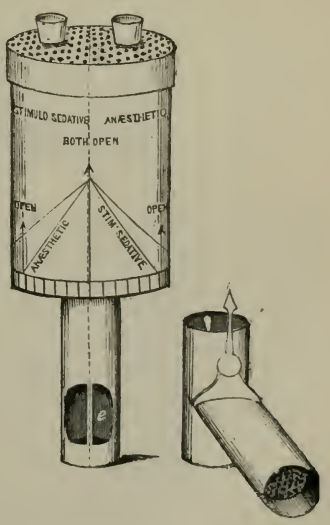
3. The inhaler or mask is to be held with the left hand, close to, or more or less distant from, the nose and mouth of the patient, whilst the chloroform-bottle, with the small glass cap removed, is to be held in the right hand, and its contents are to be *poured in a stream* over the surface of the domette (while *in situ* over the face of the patient) in such quantities as the administrator may think advisable. In fact, the bottle is to be used the same as a watering-pot for flowers. But it is necessary to bear in mind that, in consequence of the peculiar construction of the stopper, only from fifteen to thirty minims can flow at one inversion of the bottle; air must be readmitted, either by a fresh inversion, *or by shaking the bottle while in the inverted position*, in order to re-establish and keep up the flow when necessary.

N.B. For the future, Dr. Skinner adds that he will acknowledge no apparatus as his unless manufactured by Messrs. Maw and Son, of 11, Aldersgate Street, London.

Mr. Robert Ellis showed his instruments for producing Anæsthesia by Mixed Vapours.

The first of these was the original model made by the exhibitor for the application of this new principle of separately vaporising the alcohol, ether, and chloroform, and described in the 'Lancet' for February 10th, 1866. This model apparatus, which is figured in this sketch (fig. 32), was publicly used at St. George's Hospital in January, 1866. It consisted of two separate chambers, in one of which alcohol and ether were vaporised, and in the other chloroform. The mixed vapours were conducted through the lower part of the instrument and administered to the patient by an ordinary mouthpiece. But the instrument exhibited this peculiarity in addition to the

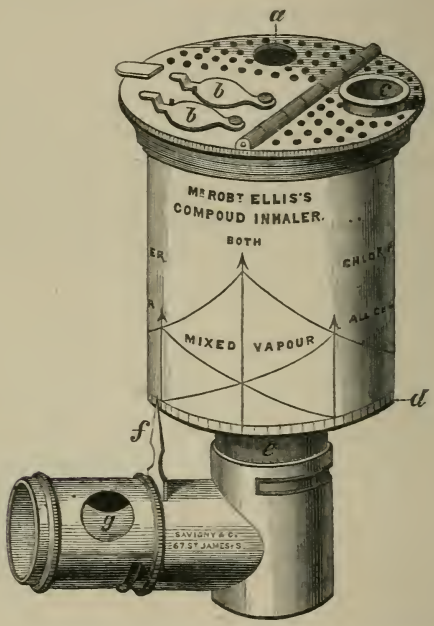
Fig. 32.



separate vaporisation of the anæsthetic fluids—that it contained a simple and perfect regulation of the quantity and a precise index of the quality of the vapours received by the patient.

The next was an improved model made to the exhibitor's design, but on precisely similar principles. In this and the following apparatus (fig. 33) the internal arrangements are precisely similar,

Fig. 33.

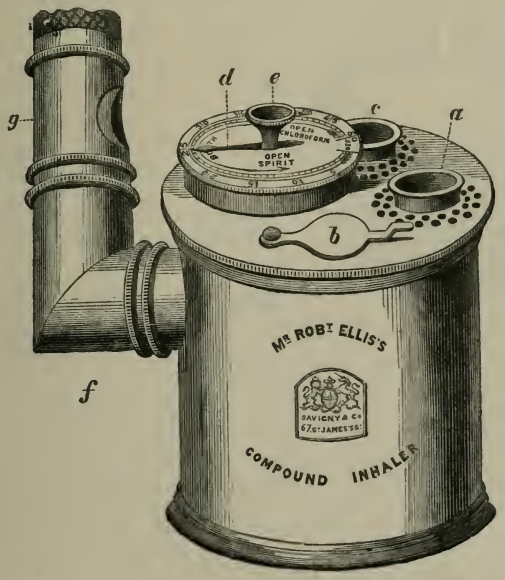


differing only in adaptation to the different shape of the instruments. The arrangements invented by the exhibitor for perfect control over the evaporation of ether and chloroform are as follows:—Within the chambers appropriated to each of these fluids is a small glass tube holding about sixty minims. Into this a few strands of cotton wick are introduced, and when charged with the chloroform or ether the capillary attraction of the wick liberates an exact quantity per minute of either fluid. The actual amount liberated on the exhibitor's system is never allowed to exceed three per cent. By this simple contrivance the greatest security is given to the operator against an overdose of chloroform.

The provision of a system for alcohol vaporisation is also a peculiar feature of these instruments. With a few pieces of brass wire a little cage is made, in miniature representing the arrangement adopted in floor-cloth factories, but really designed from a consideration of the respiratory apparatus of the fish. After much trial the very best material for evaporating the alcohol was found to be the beautiful cambric frilling made at Coventry, and perfectly free from all "dress." This fabric, an inch in width, was passed alternately over cross-wires at the top and bottom of this little frame, until fifty inches of it were contained in a space not more than three inches in depth by one inch and a quarter in diameter. Thus, hanging in vertical folds, the air inhaled passes over it without impediment, and in its course robs it of the alcohol which is poured on from above. If it be desired, so powerful an impregnation of alcohol vapour can be thus got as to be almost too irritating for use.

In addition to the precaution already described as to an overdose of chloroform and ether, the apparatus has a precise regulator which only permits of a certain quantity of vapour passing

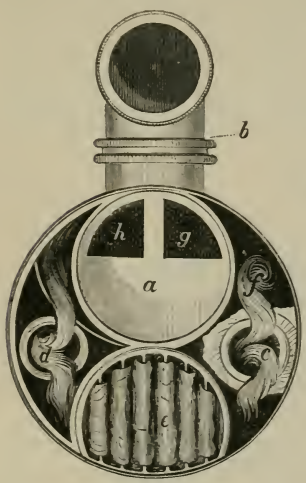
FIG. 34.



through at one time, and indicates this by a scale corresponding to the amount inhaled.

The last improvement of these instruments for compound anæsthesia is the third model (fig. 35). This consists of a metal cylinder about three inches in height by two and three-quarter inches in diameter. On one side near the upper part, the tube *f* emerges, which conveys the vaporised air from the chambers contained in the cylinder. This elbow tube has attached to it the valve *g* for admitting air at the commencement of the process, and it is movable, so as to adapt itself to the different positions of the patient. Penetrating the cylinder, it communicates with a small circular chamber, at the bottom of which are two apertures, one connected with the chloroform side, and the other with the alcohol and ether. The different currents of air charged with vapours are thus caused to come together at the bottom of this chamber, and the openings in it are covered by a circular valve perforated in one half so as to correspond with these openings, the other half being left blank. This is seen by referring to the section exhibited in fig. 35. A little consideration will show the reader that if this flat plate be turned by a pin passing through its centre, it will, according to the direction of the rotation given to it by the pin, uncover either one or other of the openings, and at one part both are wide open. After a few inspirations the air valve is gradually closed, and the index finger is advanced by single degrees up to ten. This is the point where chloroform influence faintly commences. The index is now moved still more gradually until it marks seventeen or eighteen degrees on the scale. Of these degrees, ten represent the mixed vapour of alcohol and ether, and the remainder that of chloroform. It is very seldom necessary to advance the index farther than this point in a confinement; but for a surgical operation it will perhaps be necessary to go beyond it, and to give the vapour

Fig. 35.

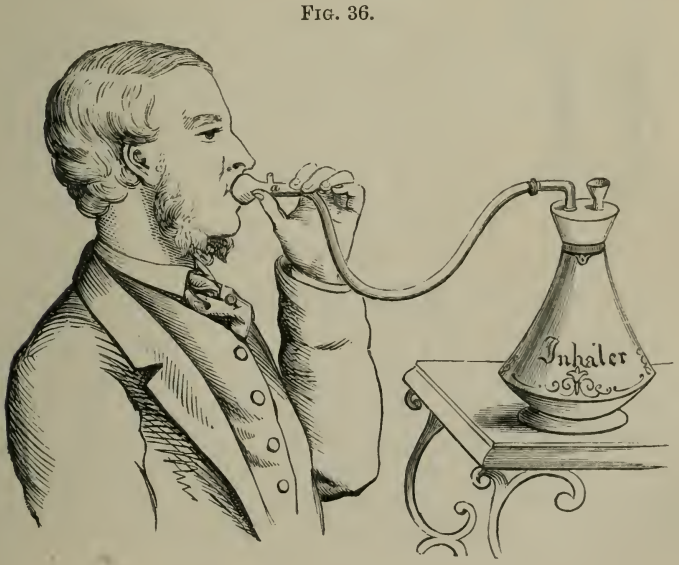


uninterruptedly from both sides of the apparatus ; or if very deep anæsthesia be demanded, then the index must be taken a full half turn onward, so as to give the predominance to the chloroform, and render the alcohol and ether mere auxiliaries. At no point is it capable of giving a dangerous dose to the patient. At a point opposite to the elbow is a small space marked " Off," indicating that when the finger is at that point, no vapour whatever can leave the apparatus. Thus it can be turned off in the intermission of inspiration, and the waste of the fluids prevented.

The chambers for all three fluids are, as in the former arrangement, quite distinct ; but those of alcohol and ether communicate with each other at one point. The fluids are supplied by pouring in a measured quantity through each of the funnel-shaped openings in the lid of the instrument. The aperture for supplying the ether is, in consequence of its excessive volatility, kept covered with a shifting metal plate, which is turned aside when the ether is poured in. The chloroform and ether chambers contain the small reservoirs (the test-tubes) as in the other instrument.

In connection with the subject of Inhalers, Messrs. Robbins, operative chemists, Oxford Street, exhibited Dr. Beigel's Uni-

Fig. 36.

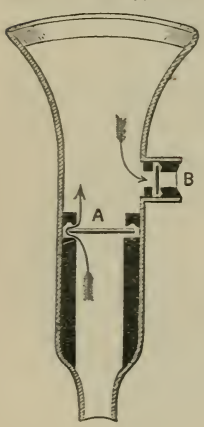


VERSAL INHALER, for oxygen and other gases, volatile fluids, and medicated vapours in general, a representation of which is here given (fig. 36).

The following are the directions for use :—Having removed the cap of the inhaler, put into the vase as much of the powder, "patent oxygenerator," as would fill an ordinary wineglass, on which pour half a pint of boiling water, *pure* oxygen is steadily evolved; replace the cap, inhalation may commence immediately, be continued from ten minutes to a quarter of an hour, and repeated once or twice a day. Volatile fluids and medicated vapours are employed in a similar manner, first putting the requisite quantity of the remedy into the inhaler, and then pouring on it half a pint of boiling water, the necessary supply of atmospheric air passing into the inhaler through the glass tube.

Should it be desirable to use a smaller quantity of fluid, the glass tube passing through the cap and cork, with a gentle pressure, may be carried lower down. The vase may be first made warm with hot water before use, if necessary.

FIG. 37.



The annexed section of the mouth-piece of this inhaler (fig. 37) sufficiently explains its construction:—The two valves (A and B) are made of vulcanite, and, acting extremely easily, close and open with great precision. It is obvious that the inhalation of the oxygen with each inspiration — during which the valve B gets closed—takes place in the direction of the arrow at A; while during expiration A closes, and the expired air escapes in the direction of the arrows at B.

CRANIOCLAST.

SIR JAMES SIMPSON'S CRANIOCLAST, or, as it might be called, craniotomy forceps, has the male and female blades somewhat like those of Murphy's craniotomy forceps, but the shank of the male blade rises in an elbow just before the joint, leaving a space between the shanks which would receive a fold of scalp and obviate pinching in the lock when the blades are closed. The instrument was exhibited by YOUNG and by FERGUSON.

CRANIOTOMY FORCEPS.

Craniotomy Forceps, to seize and hold the head for extraction after perforation, seem to have been first employed by Mesuard. A great variety were exhibited.

An old pair, with an S-shaped curve in the shank, toothed on the inner surface of the blades, and having the English forceps-lock, was exhibited by Dr. Cory.

Dr. David Davis's Craniotomy Forceps (internal), toothed. The blades fit within the skull. Figured in Davis's 'Operative Midwifery,' 1825. Exhibited by Dr. Hall Davis.

Dr. D. Davis's Craniotomy Forceps (external), toothed. The blades are applied outside the head. 1824. Exhibited by Dr. Hall Davis.

Hamilton's Craniotomy Forceps. The blades are united by a fixed joint. Exhibited by Dr. Radford.

Holmes's Craniotomy Forceps. Exhibited by Dr. Radford.

Dr. David Davis's Guarded Body Crotchet Forceps. Figured in Davis's 'Operative Midwifery,' 1825. This instrument resembles Mesuard's double crotchet, figured and recommended by Smellie.

Conquest's Craniotomy Forceps. The blades have long spikes on their inner surface to seize the skull, one is applied inside, one outside. They work on a fixed scissors-joint. Exhibited by Ferguson and Durroch.

Lever's Craniotomy Forceps work on a fixed scissors-joint. The blades are much curved; have no fenestræ. Exhibited by Durroch.

Priestley's Craniotomy Forceps.

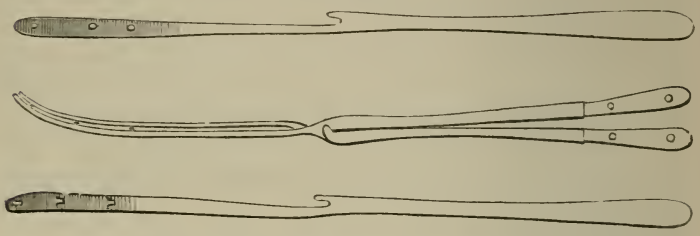
This instrument resembles Dr. Lever's, except in the teeth, which are disposed in three rows on one blade and in two rows on the other. The central row of teeth of the triple-rowed blade is received into the groove between the two rows of the opposite blade, whilst the other rows, opposing each other, perfect the grasp. The blades cross, and are united by a fixed scissors-joint. Exhibited by Matthews, London.

Radford's Craniotomy Forceps.

This instrument consists of two blades, which are introduced

separately, and articulate by the English forceps-lock. The total length is 15½ inches. The length of the handles to the joint is 8 inches. The blades are slightly curved. The external or female blade is ribbed on the concave surface, and has three perforations in it to receive three teeth projecting on the convex surface of the internal or male blade, which has ribs similar to the external blade. (See fig. 38.)

Fig. 38.



Dr. Murphy's Craniotomy Forceps, 1845.

The blades are male and female. The female blade is fenestrated, and has transverse ribs to receive the male blade, which is solid, and has transverse or duck-bill ribs. The blades are united by scissors-joint, and are almost in a line with the shanks. Exhibited by Coxeter.

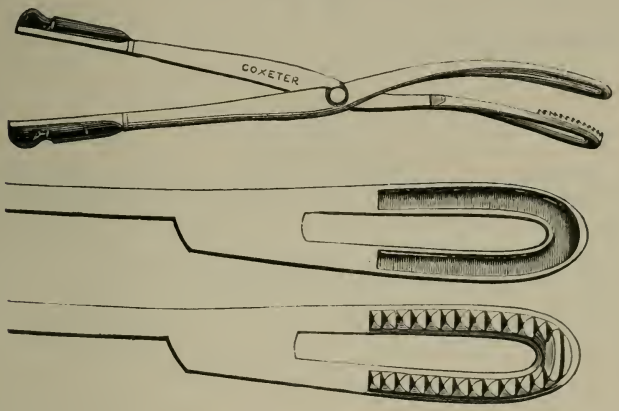
Barnes's Craniotomy Forceps.

This instrument adopts the blades of Simpson's and Murphy's instruments, and the elbow in the male blade of Simpson's. The blades, by means of the elbow, are so regulated as to be perfectly parallel when grasping the cranial bones and scalp, securing a broad diffused hold, not liable to break away portions of skull. The lock is the French forceps-lock, one blade being made to slip easily into the other after separate adjustment to the head. At the ends of the handles are holes to receive a screw, which serves to approximate the handles and secure the grasp of the blades, saving the labour of compressing by the hand, and leaving the operator's strength at liberty for extraction. Figured in 'Obstetrical Transactions,' vol. v, 1864. Specimens were exhibited by Weiss and by Ferguson.

Dr. Hall Davis's Craniotomy Forceps in general features resembles Dr. Barnes's. The male blade has a range of teeth forming a back serrated ridge in the shape of a very elongated

horseshoe. The female blade presents a corresponding groove; the blades are further fenestrated. The lock is Bruninghausen's. Instead of Dr. Barnes's screw to fix the handles, a clip like a rack is attached to the extremities. They are figured in the subjoined sketch (fig. 39), as made by Coxeter.

Fig. 39.



CROTCHETS.

Dr. Radford's Crotchet.

The length is $13\frac{1}{8}$ in.; the blade with shank is $8\frac{1}{4}$ in. long, the shank being 2 in., the screw part $\frac{3}{8}$ in. It is curved and flat, its widest part being $\frac{5}{8}$ in., and becomes round and thicker towards the shank. The hook is nearly $\frac{3}{4}$ in. long, and turned from the general curve of the blade, and stands from it at its point about $\frac{3}{4}$ in. The wooden handle is separate, and also serves for the blunt hook; it is $3\frac{7}{8}$ in. long, and flat on the hook side. It has a circular metallic end ($1\frac{1}{8}$ in.), which is hollow and threaded, to receive the threaded male end of the blade, along one side of which there is a groove, where is placed a small lever catch which falls into a notch on the rim of the shank; this steadies and fixes the blade when screwed up. The advantages of this instrument are that the blade is flat, and that it stands in a curved direction from the shank. (See fig. 40.)

Fig. 40.

Mesuard's Double Crotchet. Exhibited by Dr. Cory. This instrument was recommended by Smellie, and is figured, as applied to the child, in his work. It consists of two crotchets which articulate by the English forceps-lock.

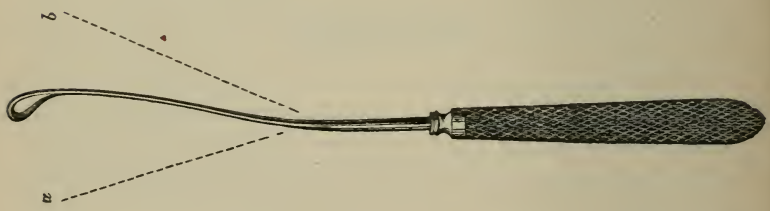
Dr. D. Davis's Double Crotchet. Exhibited by Dr. Radford.

Smellie's Crotchet, having a blunt hook at one end. Exhibited by Dr. Radford.

CURETTES.

There was no important feature of novelty in any of these instruments; indeed, the only actual novelty was the curette of Dr. Marion Sims, made by Messrs. Mayer and Meltzer, of which a representation is given in the annexed figure (fig. 41).

Fig. 41.



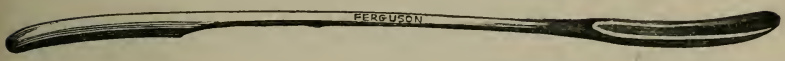
It consists of a triangular steel ring, at the end of a malleable silver stem, fixed in an ebony handle. The edge of the steel ring is sharp, and the malleable stem may be bent in any required direction, as seen in *a*, *b*.

Fig. 42.

The other varieties were the sheathed curette for the removal of soft polypi (fig. 42), invented by Sir C. Locock: the well-known

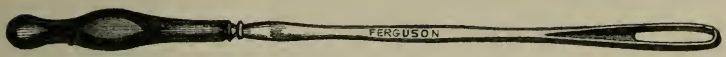
double curette of Recamier, the one, perhaps, most commonly used, which is represented in this sketch (fig. 43).

Fig. 43.



Also the no less well-known scoop of Sir James Simpson, which is represented below (fig. 44).

Fig. 44.



DECAPITATORS AND SAW FORCEPS.

Dr. D. Davis's Decapitator was exhibited by Dr. John Hall Davis. This instrument was invented in the year 1825. It is figured and described in the author's work on 'Obstetric Medicine,' p. 1172. The "Guarded Embryotomy Knife," as it was first termed, consists of two parts, separable from each other, at a common joint, like the forceps. One part is armed with a knife diagonally attached to the shank. This is first applied to one side of the neck. The other part is simply a guard, and is placed on the other side. On drawing the instrument down, the neck is cut through.

Another Decapitator (Exhibitor unknown) consisted of a strong flat steel rod, 11 inches long, having a sharply curved extremity. The whole had the shape of a hook. The concave side of the hook has a sharp cutting edge, the convex side is smooth and blunt. The cutting edge is about $1\frac{1}{2}$ inches long; the extremity is shaped like a bird's beak. This instrument has no handle, but it resembles one figured in Dr. D. Davis's work, p. 1172, which Dr. Davis states to be like one described by Celsus. Maker's name, Mathieu.

M. Mette exhibited a Decapitator Hook, with Movable Conductor, for carrying a rope round the neck.—The instrument consists of a handle and hollow stem, together 14 inches long. The extremity of the stem is curved and forms about a third of a circle. The instrument is hollow, and a strong wire passes up the centre. This wire is pushed up by means of a button sliding in the handle, and at its extremity there is a little knob which closes the open end of the stem. The instrument is used thus:—After being passed round the neck, the internal wire is pushed upwards, and this projects the knob round and beyond the other side of the neck. A loop of string can now be passed round the knob, and on withdrawing the instrument a cord is thus left round the neck. Together with the foregoing instrument were exhibited four chains and wire ropes, intended to be used in sawing through the neck.

The instrument above described was invented by Professor

Heyerdahl, First Physician to the Lying-in Hospital, Bergen, in 1855. Ropes were at first used, but chains are now recommended, the chain to be crossed in the operation, to avoid mutilation of the soft parts of the mother.

Ramsbotham's Decapitating Hook.

This instrument consists of a hooked knife, cutting on the concave side, mounted on a powerful straight stem, terminating in a handle. The hook is to be passed over the child's neck in certain cases of arm presentation where it is not possible or desirable to turn. The neck being severed, the trunk is delivered first, the head separately afterwards. Exhibited by Dr. Radford.

Dr. David Davis's Guarded Decapitator. Exhibited by Dr. Hall Davis. (See 'Operative Midwifery,' 1825.)

Mathieu's Guarded Decapitator.

This is essentially Ramsbotham's hooked knife, but it is ingeniously sheathed during application by a running jointed sheath, which can be drawn back so as to bare the cutting edge when adjusted. Exhibited by Mathieu.

Jacquemier's Embryotome (Decapitator).

This is a concealed or sheathed decapitator, in general form like Ramsbotham's hooked knife. The cutting is, however, effected by movable blades and saw-links. It has—1st, a blunt crotchet, hollowed throughout its length along its concavity by a groove or canal; 2ndly, a handle fixed by a screw, sliding easily in the groove of the crotchet, and terminating in a series of jointed blades, whose convexity projects beyond the groove of the crotchet; 3rdly, a second stem, which can, without displacing the crotchet, replace the first stem, and carries, instead of the convex blades, saw-links; 4thly, a movable sheath, which can slide up as far as the springing of the curve of the crotchet, and which serves to protect the soft parts of the mother during introduction. Either the cutting blades or the chain-saw can be worked backwards and forwards.

This instrument can be used to divide the trunk as well as the neck. Exhibited by Mathieu. Figured in Mathieu's Catalogue.

Decapitating Scissors of Dr. Hall Davis. Exhibited by Dr. Hall Davis.

Dubois' Decapitating Scissors. This instrument is curved. Exhibited by Luer, of Paris.

Dr. Eastlake's Embryotomy Scissors. Dr. Eastlake has

two pairs. One is curved on the flat, the other has a lateral curve. Exhibited by Mayer and Meltzer. They are designed, not only to cut across the cervical vertebræ, but also to divide other parts of the body.

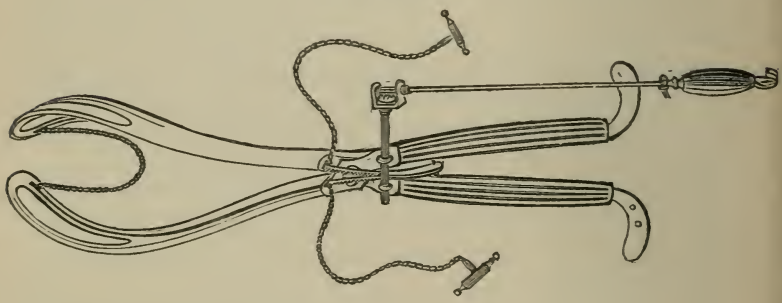
Mattei's Endotome is a powerful instrument working on a scissors-joint; the shanks are double curved, so that by approximating the handles the curved blades can be brought together. This instrument serves well for decapitating and for dividing other parts of the body. Exhibited by Dr. Mattei.

Van Huevel's Chain-Saw Forceps ("Forceps-scie").

This instrument is the invention of Professor Van Huevel, of Brussels. His original memoir describing the instrument is dated 1842. It is intended to be used in cases where craniotomy is necessary, and by its means the head is sawn through at the part presenting, the head having been previously seized by the forceps. An extremely ingenious contrivance enables the operator to introduce and apply the chain-saw after the blades of the forceps have been applied.

The original instrument, a copy of which was exhibited by Messrs. Weiss, of the Strand, and is depicted in this woodcut (fig. 45), consists of a very strong pair of forceps, having a shape

Fig. 45.



closely approximating Levret's forceps; the blades are very firm and much thicker than those of the ordinary forceps. The length of the whole instrument is 23¼ inches, the distance from the hinge to the extremity of the blades is 13 inches. Each blade of the forceps has on its inner aspect a groove, extending from about 1 inch from the extremity to near the joint. This groove is

so shaped that it allows a band of steel 15 inches long and $\frac{5}{10}$ths of an inch broad to traverse it. The band of steel is smooth on one border and dentated on the other, and the chain-saw, next to be described, works on the extremity of the band of steel as round a pulley.

The chain-saw is 44½ inches in length; the links are small; the chain is smooth on one side and jagged on the other. It is provided with two small handles, and by means of these handles it is worked.

Another part of the instrument is an apparatus for pushing the steel band or chain-carrier up the grooves in the forceps. Just below the joint there are two projections, which are perforated, so as to allow of the passage of a small fluted roller. This fluted roller is turned round by a long rod and handle as shown in the engraving, and the rotation of this roller propels the chain-carrier with the chain-saw up the grooves in the forceps, the teeth of the chain-carrier corresponding to the grooves in the roller just described.

To use the instrument, the forceps are first applied in the usual way. The chain-saw is next introduced, a long loop of the chain being left hanging down, as shown in the drawing. When the chain-carrier has been pushed home, it is there held fixed, and the chain-saw is brought into action. The effect is that the scalp and bones of the skull are sawn through up to a line passing horizontally across from one blade to the other. During this part of the operation the blades of the forceps are maintained closely applied to the head.

The advantages claimed for the instrument are that it accomplishes more completely, more readily, more safely, and more certainly, the reduction of the bulk of the head in cases of obstructed labour, than can be effected by the ordinary method of craniotomy. The safety of the operation by this instrument, as compared with that of other perforating instruments, is particularly insisted on by its advocates. The head, being firmly held, cannot slip during the operation.

Chain-saw Forceps of Van Huevel, modified by Professor Faye and M. Mette, of Christiania.

This instrument dates 1855. Two instruments were exhibited, one having the pelvic curve, as in Levret's forceps, one straight.

1. The *straight* instrument measures — total length, 15½

inches; length of blades, $8\frac{1}{2}$ inches; length of chain-saw, 36 inches.

2. The *curved* instrument has a total length of 16 inches; length of blade, $8\frac{1}{2}$ inches; breadth of blades, $1\frac{5}{8}$ inch.

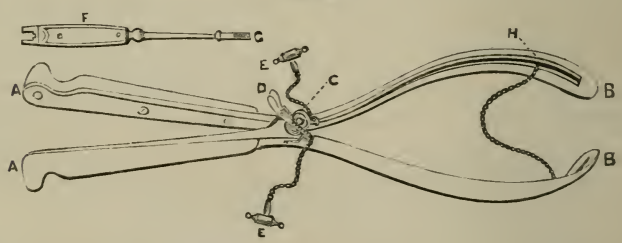
These instruments differ from Van Huevel's in this particular, that the chain-carrier and groove are dispensed with. Between the fenestra of the blades, 2 inches from the extremity, passes across a flat bar of steel, in which is a small pulley, and round this pulley the chain works. In using these instruments of Faye and Mette, therefore, the chain-saw is introduced at the same time as the blades of the forceps. Exhibited by M. METTE, of Christiania.

CHAIN-SAW FORCEPS, by BILLI, exhibited by Professor LAZZATTI, of Milan.

This instrument is smaller than Van Huevel's original. It differs also from Van Huevel's in the mechanism by which the chain-saw-carrier is introduced.

Total length is $18\frac{1}{4}$ inches; distance from joint to extremity of blades, $10\frac{1}{2}$ inches; greatest width of blades $1\frac{1}{4}$ inch; greatest thickness, $\frac{1}{4}$ inch; length of chain-saw, 30 inches.

FIG. 46.



The mechanism for introducing the chain-carrier will be evident from the woodcut (fig. 46). F is a separate and independent handle, having a fluted extremity (G). This fluted extremity is inserted through a perforation in the pivot C, and thus can be made to act on the teeth of the chain-carriers D. Exhibited by Professor LAZZATI. Maker, D. Gennari, Milan.

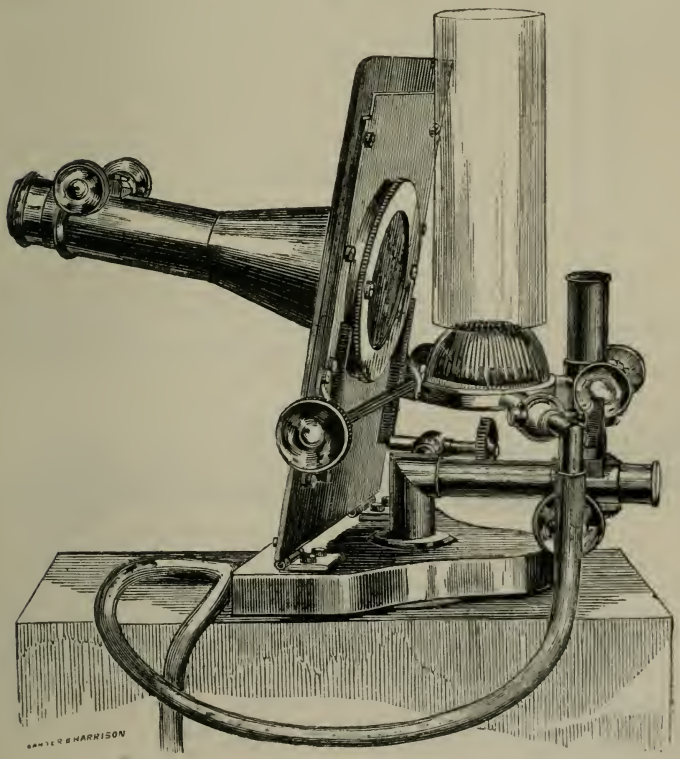
DENTISCOPE.

Mr. Francis L. West, of Cockspur Street, exhibited Mr. Rhan's Patent Dentiscope, Laryngoscope, Light-intensifying and Concentrating Apparatus, for general, surgical, and other operations.

This instrument is constructed for the purpose of illuminating the inside of the mouth with a concentrated and intensified light, for dental or surgical operations. It is represented in fig. 47.

It consists of an optical arrangement of lenses in a cone and tube, with a rack-and-pinion adjustment for focussing. This is mounted upon a plate, which moves in dovetails upon a larger plate, that forms a screen, with racks and pinions to raise

Fig. 47.



and lower the optical arrangement at pleasure. The screen is jointed to a massive foot or stand, provided with a double-threaded tangent screw, with a bold milled-head nut for adjusting the screen to angles of elevation or depression.

At the back of the screen, and upon the foot or stand, is fitted a branch pillar, carrying a Leslie's Patent Argand Gas-burner, with stop-cock and connecting piece, to which may be attached any length of india-rubber flexible gas tubing to communicate with any gas supply on the premises, or provided in a portable india-rubber gas bag, to be placed in a suitable and convenient place for the performance of the operation.

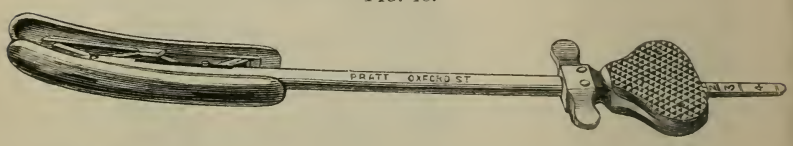
The branch and pillar carrying the gas-burner is fitted also with racks, pinions, and milled-head nuts, to adjust the flame to the necessary distance and height required by the variable position at which the optical arrangement may be required. The whole of this structure is fitted upon a circular plate, with centre cone or turntable—thus the instrument may be brought instantly into any position required.

DILATORS.

1. Rectal.

Mr. Pratt exhibited Dr. F. Bird's Rectum Dilator, which is figured in the annexed sketch (fig. 48). It is a modification of a similar instrument made for the male urethra. The engraving

Fig. 48.



shows its peculiarity in being curved, and having a short dilating part which is intended to pass within the sphincter ani. Dilatation is accomplished by screwing or unscrewing the flat portion of the handle. It requires care in withdrawal, and it is recommended to close the blades on a couple of pieces of cork, which, protruding beyond the sphincter, avoids all danger.

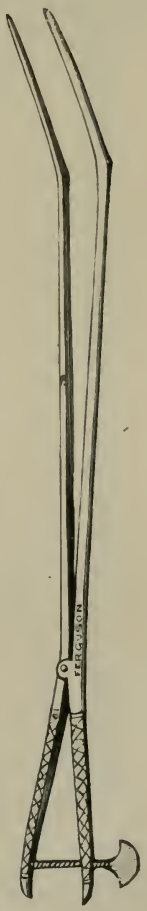
2. Urethral.

Dr. Routh and M. Hardon, of Paris, exhibited Dilators for the Female Urethra, the latter of which was three-bladed, and resembled at first sight a pair of tweezers; but on compressing the handles, which were kept apart by a spring, the three small blades diverged in opposite directions.

3. Uterine.

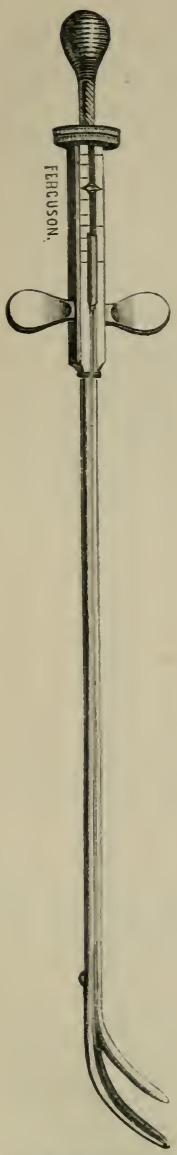
Of uterine dilators there were a great variety, the differences having reference chiefly to three points—first, as to the end of the instrument, whether the two blades should be united or not; secondly, as to the existence or non-existence of supports to strengthen the instrument when opened; and thirdly, as to whether there should be merely a single joint at the extreme end of the instrument, or, in addition to that, one on either side about three eighths of an inch from the end. It is obvious that in the former case the instrument, when opened, forms a kind of ellipse, while in the latter case the blades separate more or less parallel with one another.

Fig. 49.



The instrument invented and used by Dr. Rigby in the year 1840, and exhibited by Ferguson (fig. 49), is a large and powerful instrument, the blades not being jointed at the end, but separating in their entire length, the separation being effected by a screw process at the handle. The instrument was not only longer, but very much larger, than the uterine sound.

Fig. 50.

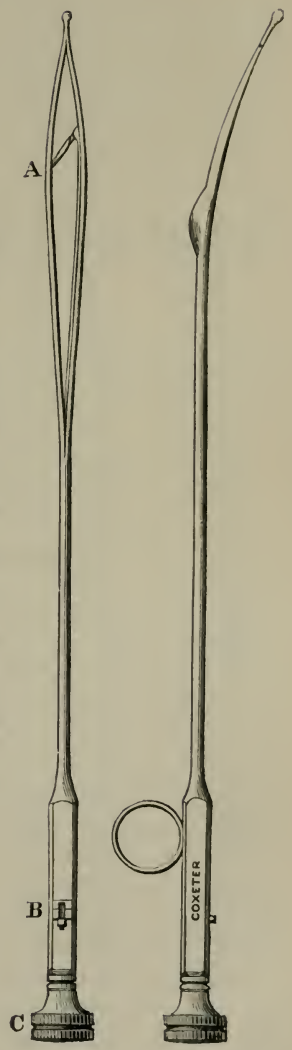


Protheroe Smith's Dilator for the Os Uteri.

Dr. Protheroe Smith's instrument somewhat resembled Dr. Rigby's, but it differed in that at about an inch and a half from the end there was a somewhat abrupt curve, so that it resembled an ordinary lithotrite. It also was larger and heavier than the ordinary uterine sound, and was opened by a similar screw process. It is shown in the annexed engraving.

Mr. Ellis's instrument acts on precisely the same principle as Dr. Rigby's; the two blades separating in their entire length, but it differs widely in construction from both the former. This dilator was described as invented in 1860, and was stated by the inventor to be the first made of the exact form of the uterine sound. The value of separating the blades, Mr. Ellis thinks, is twofold—first, they exert their chief dilating power over the internal os; and secondly, that the instrument can be easily cleansed of blood and mucus. Being the exact size and shape of the uterine sound, it can be readily introduced.

Fig. 51.



Dr. Priestley's Dilator resembles Mr. Ellis's in the fact that it is of the same size and shape as the uterine sound. It differs, however, in this particular that, while the blades separate, their extremities remain united, so that they form a sort of elliptical opening. All these points are illustrated in the annexed sketches. A shows the blades separated; at B is a little indicator showing the extent to which the blades are opened, while C is the screw by which the process is accomplished. The instrument is represented about half the actual size.

Drs. Greenhalgh and Hemborough have introduced instruments which are modifications of the latter. In them the ends of the blades remain united; but they differ from Dr. Priestley's in being jointed, and that not at the extreme end only, but at a short distance from the end; so that, as the blades separate, the latter joints admit of expansion in almost a parallel direction. Much greater strength and dilating power is given to the instrument by the third or central rod, which passes down its middle, and is the means of, as it were, pulling open the blades.

Fig. 52.

Dr. Hemborough's instrument is here represented open (fig. 52). It has three joints—a central (B), and two lateral (A and C). To the centre one (B) is attached a rod (D), which is included within the two halves when the instrument is closed.

By shortening the rod D dilatation is accomplished to the extent required by turning the screw-handle.

Dr. W. Bryant exhibited a Case of six Uterine Dilators, all of which fitted on to one handle.

Dr. Savage's Dilator consisted of a double-action instrument, acting like Smellie's scissors. A rack at the handle, marked and graduated, regulates the extent of divergence of the blades. When used for dilating the isthmus (inner os ?) uteri, the blades act by simple divergence to the extent previously *set* at the rack. For the remainder the instrument cuts its way out by a combined pressure and action of withdrawal performed by the hand.

The instrument was invented by the author for the more certain and safe dilatation of the isthmus, as well as that of the rest of the canal and outer os.

Dr. Marion Sims' Cervical Dilator consists of two blades joined at their distal extremities, like the dilators of Priestley and others; a joint exists in each blade about half an inch from the extremity. The instrument works much like an

ordinary pair of tenaculum forceps; by compressing the handles the blades open, and by a graduated rack-work fixed in the handles the amount of dilatation can be read off.

M. Matthieu's Uterine Dilator embodies the same principle of action as those of Drs. Greenhalgh and Hemborough; but while they opened, as it were, bilaterally, this opened antero-posteriorly, on the face of the curve as it were, as may be seen in this drawing (fig. 53). There are two joints at the end, which

Fig. 53.

admit of the upper portion riding over the lower, by means of the little cross-bars, while the screw at the handle regulates the degree of riding, and therefore of dilatation.

4. Vaginal.

Vaginal Dilators or Plugs for arresting uterine hæmorrhage.

M. Stille, of Stockholm, exhibited a Uterine Plug, which consists of an india-rubber ball, having a flexible tube attached to it, and a firm cylindrical tube passing through its centre. One extremity of this central tube ends on the further surface of the ball, and the other terminates some 7 or 8 inches behind it, and is provided with a stop-cock. The object of this tube is to give evidence of bleeding without having to remove the plug. The other flexible tube is to conduct fluid or air into the ball, which becomes distended to the required extent.

Professor Braun's, of Vienna, consists of a ball fastened at one extremity of a stiff tube, which at the other end is provided with a stop-cock to retain the air or fluid after distension. It may be useful in some cases, but it is not equal to M. Stille's.

Dr. Greenhalgh's "Original Felt Expanding plug for Hæmorrhage" was exhibited by Ferguson.

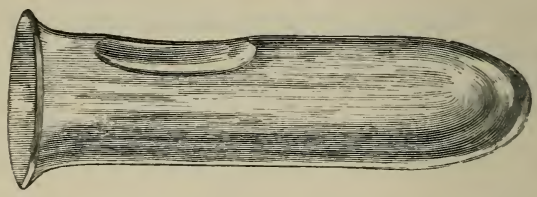
This consists of an elastic tube 12 to 16 inches long, terminating in a bulbous extremity, which is covered or capped with felt or

spongio-piline. It is inflated by means of an air-syringe, and completely fills the vagina when distended. They are made of various sizes.

West's Vaginal Plug was exhibited by Ferguson. This instrument consists of a large india-rubber ball, springing from a curved stiff tube, ending in a stop-cock. It has a ring close to the stop-cock, by which it is kept or fastened *in situ*. It can be inflated by air or distended by water.

Messrs. Mayer and Meltzer exhibited Dr. Marion Sims' Glass Vaginal Dilator, which is used by him for dilating the vagina after his operation for vaginismus. It consists of a tube about three inches long, as is represented in the annexed sketch (fig. 54),

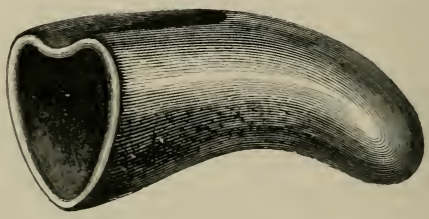
Fig. 54.



slightly conical and closed at one end, open at the other, about an inch and a quarter in diameter at its largest part. There is a depression or sulcus on its upper side for the urethra and neck of the bladder. The outer open end allows the pressure of the atmosphere to assist in retaining it easily in the vagina.

Dr. Marion Sims also uses another form of Vaginal Dilator,

Fig. 55.



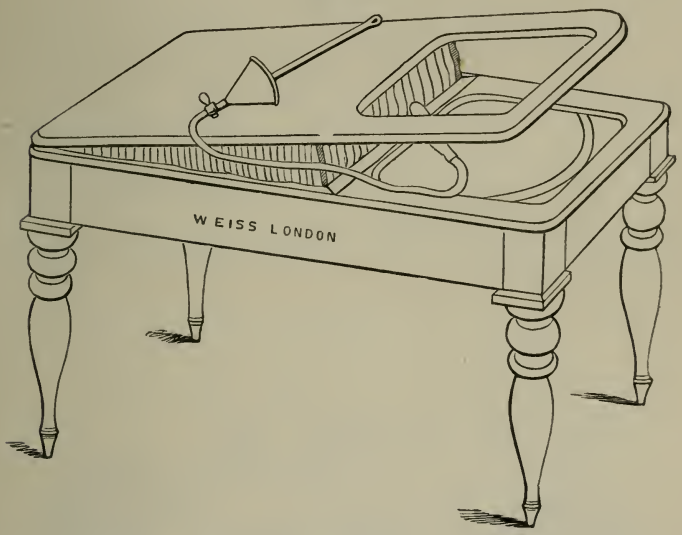
which is represented in this sketch (fig. 55). The downward curvature of the conical extremity prevents it from striking against and hurting the uterus, and it more effectually presses

in the direction of the fourchette and perineum, when that is necessary.

DOUCHES.

The Self-acting Douche of Messrs. Weiss is represented in the annexed drawing (fig. 56). It consists of an ordinary bidet,

Fig. 56.

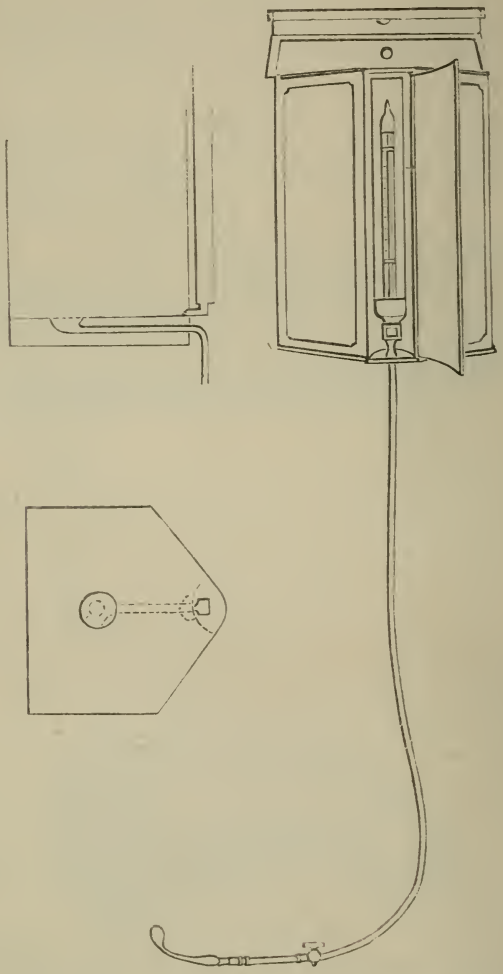


standing upon four legs; the vessel is filled with water, and the lid raised thereby, as represented in the sketch, an elastic tube and mouthpiece attached being fixed to the vessel containing the water. The patient then introduces the mouthpiece, and sits upon the lid, the vagina being over the open empty pan. The weight of the patient forces the water from the reservoir just as it would do the air from a pair of inflated bellows, the fluid flowing in one continuous stream. This apparatus is therefore easy of application, as it is strictly "self-acting."

Professor Lazarewitch exhibited his Apparatus for the methodical employment of the Uterine Douche. It is represented in the subjoined sketch (fig. 57). It consists of a cylindrical vessel, in the bottom of which is an opening covered with a per-

forated metallic plate to prevent the passage of any insoluble materials in the water. In connection with that plate is a metallic pipe, which passes under the double bottom of the apparatus. To the end of that pipe a long elastic tube is fixed, furnished with a

Fig. 57.



zinc curved mouthpiece, the point of which is oval and perforated. A brass cock exists at the end of the elastic tube. In front of

the apparatus, in the trough-like cavity, is placed a glass cylinder, which communicates below with the cavity of the vessel. When in use the water passes from the vessel into the glass cylinder at an equal height, and thus we may measure the height of the water in the vessel. In the aforesaid glass cylinder is fixed a thermometer, to register the temperature of the water.

The author claims for this instrument the following advantages:

1. The water passes out of the tube in a uniform uninterrupted stream, in accordance with the laws of hydrostatics.

2. The strength of the stream may be regulated *ad libitum* by the height at which the vessel is placed.

3. The quantity of fluid used for the douche may be settled by the direction of the physician.

4. The temperature of the water is easily determined by the thermometer which is placed in the glass syringe.

Messrs. Maw & Son exhibited Savory's Vaginal Douche, which is figured in the annexed sketch. It is exceedingly portable, and

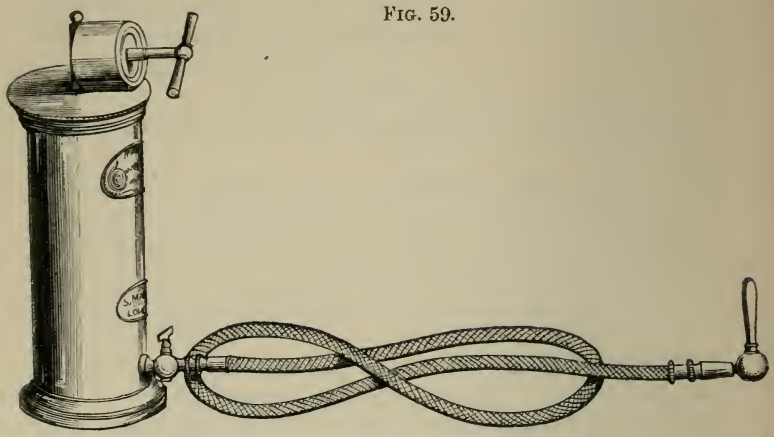
Fig. 58.

easy of application. As may be seen, there is an elastic bag or bottle which is to be filled with the fluid to be injected; to this is attached the elastic hand syringe, and an india-rubber tube and mouthpiece complete the arrangement.

The same makers exhibited the Irrigateur of Dr. Equisier, which is made on the self-acting principle, and may be used for enemas as well. The plug in the barrel of the instrument, being filled with the fluid to be ejected, is wound up by the handle at the top, and, the mouthpiece being inserted, the fluid is then ejected by the force of a spring, which runs down, as it were, like

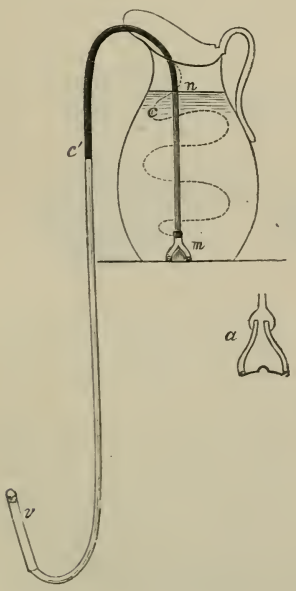
a clock. The instrument is shown in the adjoining illustration (fig. 59).

Fig. 59.



The Portable Uterine Douche exhibited by Messrs. Weiss and Son is a very useful instrument. It is constructed of caoutchouc, and is easy and simple in its mode of employment.

Fig. 60.



Dr. Rasch's Vaginal or Uterine Douche, which is represented in the annexed drawing (fig. 60), consists of a long india-rubber tube from 6 to 7 feet long, and as thick as the little finger, made heavy at one end with a hollow bell-shaped lead, the base of which has large grooves to allow the entrance of the fluid from the very bottom of the vessel. An elastic thick bougie, with several holes in the bulbous end, and not less than 5 inches long, is fastened at the other end of the hole.

To use the instrument, *completely* immerse about 2 feet of

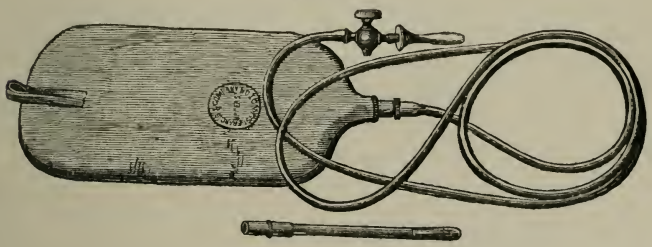
the tube along with the metallic end in the fluid, then compress the tube, *below* the fluid, with the thumb and forefinger, and draw it out over the brim of the vessel. By this means the filled tube is brought *lower than the surface of the fluid in the vessel* (which must be placed as high as possible, on some piece of furniture), and after removing the fingers a constant stream will be established. The other end is for insertion into the part to be injected. The patient sitting over a basin on the floor will prevent all splashing about of the fluid.

To use the instrument for applying a clyster the same manipulation is required. A pint of warm water and some oil will have the desired effect. The instrument is made by E. Lewis, Chemist, 31, City Road, Finsbury Square, E.C.

Dr. Sansom's Uterine and Vaginal Douche is constructed so as to apply an uninterrupted stream of fluid to the uterus or vagina, and thus to spare the necessity of the frequent removal and reintroduction of a vaginal tube. The effect of an uninterrupted stream, the author thinks, is of the highest importance. Dr. Sansom has succeeded in the course of a few minutes in dilating the os uteri by a stream of water projected against it; and by supplying patients suffering from the less chronic conditions of retroversion of the uterus with a vaginal pipe so constructed as to allow the jet to impinge upon the displaced fundus, and instructing them to use the douche at frequent intervals, he has found that the organ has tended to regain its normal position.

The instrument consists of a closed india-rubber bag, capable of holding three pints of water. From its inferior portion passes

Fig. 61.



a long tube, ending in a vaginal pipe. To fill the bag, place the vaginal pipe in water, and roll up the bag so as to expel all the air it may contain; place the emptied bag on a low level—the

floor, for example—then, the tube becoming a syphon, the bag soon fills. Of course, any lotion may be used instead of water. The bag being filled, it is to be hung up by its loop at a height proportionate to the force of the stream desired. The patient then introduces the vaginal pipe, and controls the stream by the tap. The instrument is represented in this sketch (fig. 61).

It is made by Messrs. Francis, of No. 2, Upper Street, Islington.

ECRASEURS.

Of these instruments a considerable number were exhibited, showing a great variety in form, mode of working, and in the material used as the cutting part: some having a screw power, others the click-clack movement; two working at right angles to the line of division; some having chain, others wire rope or a single wire, and others watch-spring.

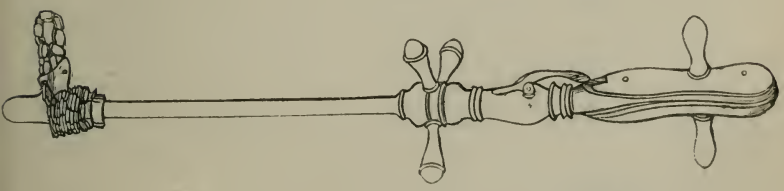
Mr. Spencer Wells exhibited one invented by him in the year 1858. It was 12 inches long, working with a screw, having three arms in the handle. The eye of the instrument expanded to $\frac{3}{4}$ inch, being $\frac{1}{4}$ inch thick. Inside the eye are two metal rollers to lessen the friction of the wire or cord when in use. The edges of the eye inside are sharp, so that its action is necessarily more or less in a line with the shaft, otherwise the wire or cord would be cut through. It was made by Savigny (now Whicker and Blaise), *vide* 'Medical Times and Gazette,' May 7th, 1859.

Chassaignac's Chain Ecraseur, with click-clack movement and straight shaft, was exhibited by Ferguson and Durroch.

A similar instrument, with *curved* shaft, was exhibited by Ferguson.

Dr. Haake, of Leipzig, exhibited a Chain Ecraseur, in which the shaft of the instrument was straight, carrying a screw which coiled up the chain on its upper part in a downward direction, so that the line of section was at right angles to the shank. To lessen the amount of torsion of the shaft, the arms of the screw-handle are placed about the middle of the instrument, the lower half being the handle whereby to steady it. The instrument is represented in the adjoining sketch (fig. 62).

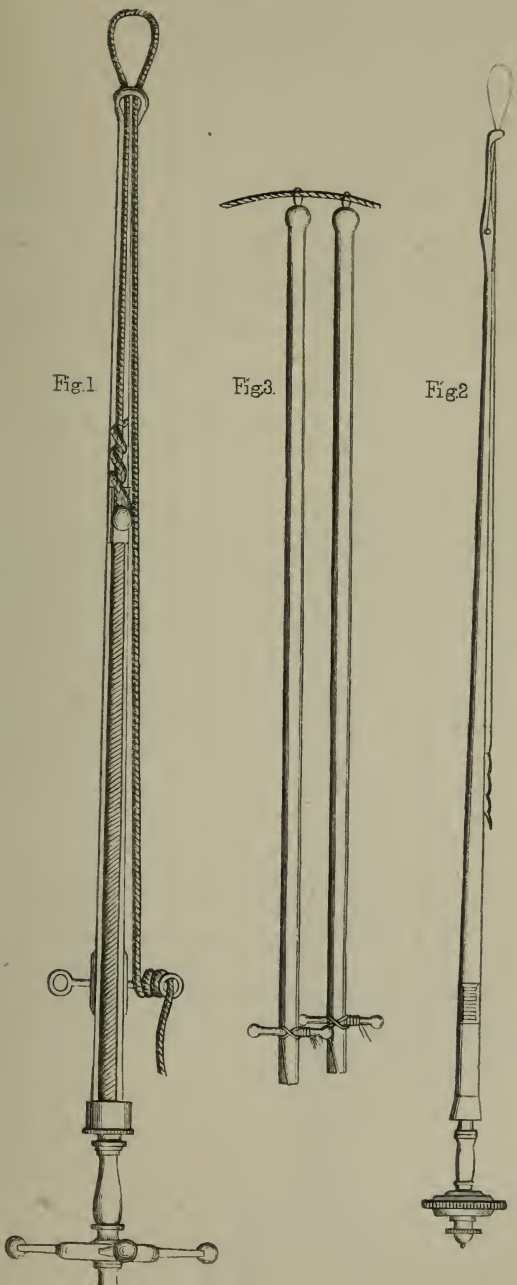
Fig. 62.



Mr. Hilliard, of Glasgow, exhibited an instrument, made by himself, of a similar description, but coiling up the chain in an upward direction, *i. e.* towards the extreme end. Instead of the arms of the screw-handle being in the middle, they were at the end of the shank.

Dr. J. Braxton Hicks exhibited an Annealed Steel-wire Rope Ecraseur (fig. 63), made by Durroch, of various sizes. The large size (fig. 1) consists of a shaft about 15 inches long, fitted with screw power, having three arms to handle, and a traversing hook to which one end of the wire rope is fastened. The eye is oval, having the edges everywhere carefully rounded, so as not to cut the rope, even if at a considerable angle to the shaft. The eye is also placed at a slight angle to the shaft, to the side on which the hook is placed; so that it forms altogether a considerable curve on which the rope bears while in use; the instrument can thus be used in any position within the vagina and uterus. There is a cross-bar at lower end of shaft to which to fix the rope after adaptation. Any sized rope can be used: for the largest, one made of 60 or 70 strands of carefully but not too fully annealed steel wire is required for the removal of the cervix uteri and the larger polypi. The rope should not be twisted too tightly nor made too neatly, for roughness adds much to the cutting power. The rope in all cases should be made up of secondary ropes of 5 or 6 strands in each; even made of 80 strands it is still very flexible. In cases of intra-uterine polypi, or in those where they are of great size although in vagina, canulæ (fig. 3) with handles are added, through which a small rope of 2 or 3 strands is passed up and down, so as to leave a small loop at the end. Through this loop the wire rope is passed, and by means of two or three of these it is carried round the polypus. The rope should be separated from the écraseur if only two canulæ are used; and one should be made to hold the rope tightly, while the loop of the other should run easily over it, so as to carry it round the polypus freely. The ends of the rope are then passed through the eye of the écraseur, which is pushed up to the neck of the growth; after which the ends are fastened, one to the hook, the other to the cross-bar. The canulæ are now to be removed by pulling down one end of the wire loop till it is free from the rope. These instruments can be made of various sizes, or with movable heads of various sizes.

Fig. 63.



A small instrument (fig. 2) was also exhibited by the inventor for a rope of 2 to 3 strands, for removing small vascular outgrowths of cervix uteri, &c., through the speculum. The hook should be broad where the bearing of the wire rope occurs. The inventor prefers having two hooks back to back, over which the rope is fastened like the figure 8. By this arrangement the rope can be refastened: when, in cutting through any large tumour, the hook comes to the end of the shank without having completed the severance, the rope can be unfastened, the hook screwed up to the upper end again, and the rope refastened to it.

The drawings are about half the natural size.

Specimens of the same instrument were also exhibited by KHRONE and by COXETER.

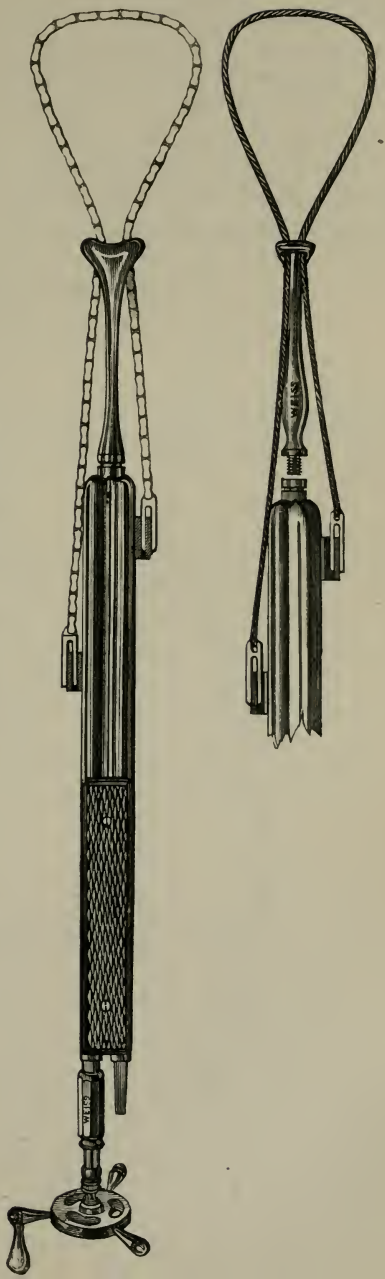
Ropes were also exhibited by METTE, of Christiana, for similar purposes, having a core of stout catgut, over which was plaited small iron wire, and some of stouter wire than usual, which rendered it not so flexible.

There was also an instrument which had, instead of a flexible rope or chain, a series of 3 or 4 watch-springs bent in the form of a hoop, which, passing through the eye of the écraseur, was fastened to the traversing hook. The power employed was that of the screw. The edges of the eye were sharp, and the line of section was continuous with the axis of the shaft, the inflexibility of the springs laterally not permitting any further adaptation. It is an instrument, therefore, more adapted to external than internal use. The loop, evidently, was one of great tenacity.

M. STILLE, of Stockholm, exhibited a small écraseur, which was worked by a screw, moved by a sliding bar to give increased leverage. The shaft was curved towards the end, so as to bring the line of section at an angle to the shaft; while the stout copper wire which was employed instead of a chain, &c., worked, as it were, in a groove formed by the curved shaft. It was altogether 9 inches long. Both ends of the wire were attached to the hook, coming down simultaneously when in use.

One nearly similar was shown by DURROCH, of French make, but the shaft was straight.

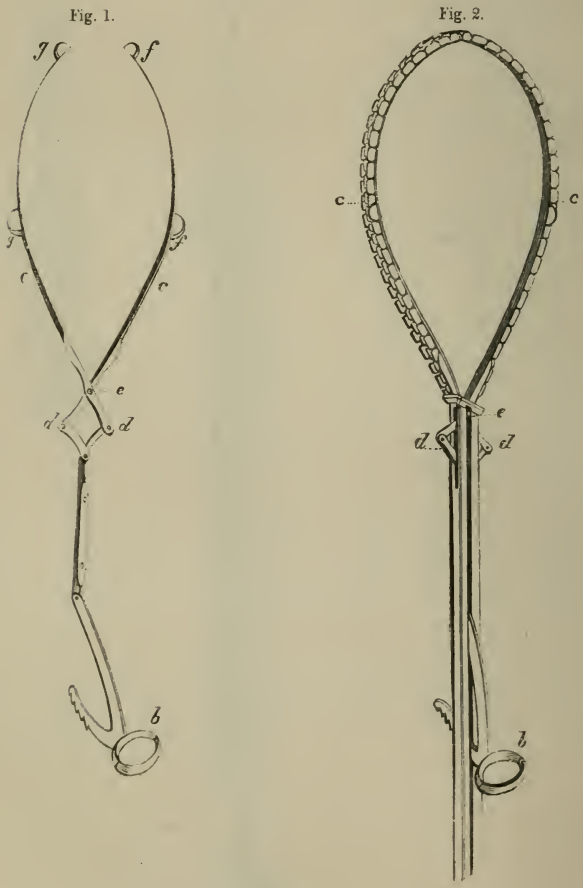
Fig. 64.



Messrs. Weiss exhibited an Ecraseur fitted with two screws side by side, to each of which a hook was attached: these screws were worked by a shifting handle, so that the sides could be worked alternately by changing the handle from one screw to the other. This instrument is represented in the annexed illustration. Besides this, it was made with various heads; so that either the chain, with a suitable eye, or the wire rope of various sizes, with three heads and eyes proper for the rope, could be employed at pleasure.

Dr. Marion Sims exhibited a Chain Ecraseur, to which he had adapted an apparatus which had for its object the keeping open the loop of the chain during application round a polypus. This was effected by means of a spring of two blades (*c c*), parallel when closed, separating at the extreme ends (*f f*); with an arrangement by which it not only can be opened when required, but also removed when the chain is properly applied. The double spring is placed inside the chain-loop; after it is passed into the vagina, the blades are expanded (as in fig. 2); the loop is then

Fig. 65.

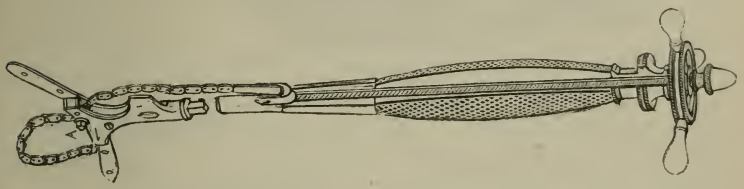


passed within the cervix, and the polypus surrounded by it. When this is accomplished, the spring is withdrawn, leaving the chain only round the growth, which is then divided in the usual manner. To prevent the chain from slipping off the blades of the spring, small loops (as at *ff*, fig. 1) are placed on the lower edge of the spring on which the chain rests.

This instrument was made by Messrs. Mayer and Meltzer.

Professor KRASSOVSKY exhibited, through Professor Hugenberger, his ECRASEUR, part of which is also used as a clamp in ovariotomy, the instrument being divisible in two parts (as seen in the drawing). It is made on the principle of Charrière's

FIG. 66.



écraseur, and consists of two parts, a chain and screw. The part with the chain is used for compressing the pedicle of the cyst; the small screw A, with a key for fixing the chain on any spot as occasion may require. The back surface of this part, covered with ivory, comes in contact with the patient's skin, while the metallic portion is applied outside. After compressing the pedicle, this part of the clamp is retained in that position, so that neither branch may fall into the wound. The part with the screw forms part of Charrière's écraseur. At present the Professor uses a hot wire to the pedicle of the cyst.

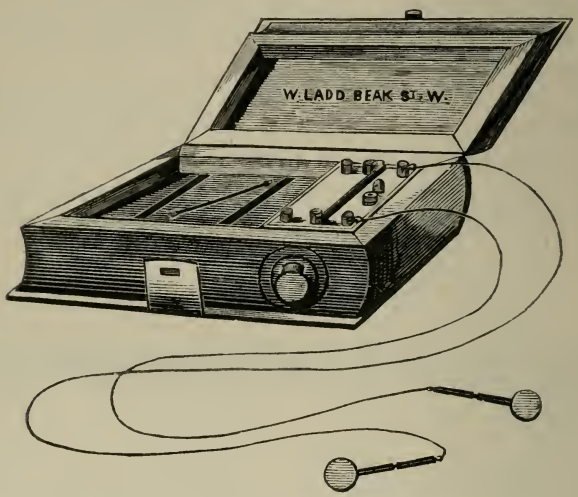
ELECTRO-MAGNETIC COIL.

Mr. W. LADD exhibited an ELECTRO-MAGNETIC COIL, for medical purposes.

This apparatus, which is represented in the annexed illustration (fig. 67), forms a perfect electro-magnetic battery. When closed it resembles a book with a clasp, and can be carried in the hand or under the arm. Upon unclasping and opening it, will be found a small tray, containing the conductors, wires, bottles of

the exciting salt, &c. On the right of the tray is the vibrating spring, poles, &c.

Fig. 67.



On the left of the book is a small door, which upon being opened exposes the sulphate of mercury battery, which is chosen from its extreme cleanliness and high electro-motive force. The tray is made of ebonite; within this is a cell of carbon, cut out of the solid block; this is lined with a piece of cloth or lint, and upon this is placed a slab of zinc, a piece of which is bent up and faced with platinum. There is also a copper connecting-piece for the carbon-cell.

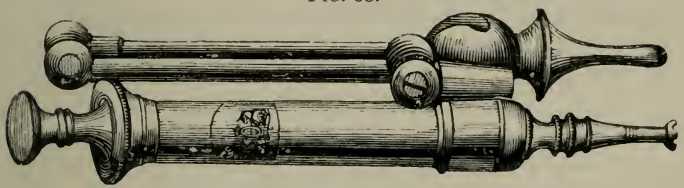
To excite the battery, place sufficient sulphate of mercury salt on the carbon tray to cover it over and make an even surface; the lint is placed above this and left sufficiently large to turn up at the sides, so as to prevent contact between the zinc and carbon; about a teaspoonful of water is then poured on it, and the zinc plate placed upon the lint. The tray must then be put back into the box and closed. The battery is now in circuit with the primary wire of the coil. The spring must be adjusted by the eccentric button, which should be gently turned round until the vibrations show that the battery is in action; by turning the button back a little the vibrations are diminished in frequency. On either side of the vibrating spring will be perceived two nuts

with holes through them, those on the left marked P + and P —, those on the right S + and S — : P + means the positive pole of the primary wire, P — the negative pole of the primary wire : S + signifies the positive pole of the secondary or finer wire, S — the negative pole of the same wire. If we wish to use a very gentle current, the copper pegs of the conducting-wires are inserted into P + and P — respectively, and upon holding the conductors in the hands a hardly perceptible current is experienced; to increase this, the brass handle in front of the box to the right of the clasp is gradually drawn out, and the soft iron core contained in the centre of the coils is gradually exposed and magnetized, increasing the strength of the transmitted current; push back the brass tube, and insert the pegs of the conducting wires into the nuts, S + and S —, and we get the current from the secondary wire, which is much more powerful than that from the primary wire. Now gradually draw out the brass tube, and the current becomes by degrees so powerful as to be unbearable. With this little battery any *requisite* power can be obtained. If it is in regular daily use, the carbon-cell will have to be cleansed about once a week; the lint should be taken out and well washed, so as to remove all the yellow deposit; then rinse out the carbon-cell with fresh water and wash the under surface of the zinc; replace the lint, and the battery is now ready to be re-excited. The process of cleansing need not take more than two or three minutes, and is only necessary about once a week.

ENEMA APPARATUS.

Mr. Salt exhibited a Portable Enema Apparatus, without detached parts, which is illustrated in the annexed sketch (fig. 68).

Fig. 68.



It is certified by the leading practitioners in Birmingham as being simple in construction, facile in use, and in every way fitted for the purpose for which it was invented.

FEEDING BOTTLES.

Mr. Cooper, Chemist, Oxford Street, London, exhibited an appliance which he calls the British Feeding Bottle for regulating the supply of Food for Infants, the principal merits of which appear to be, that it is very easily cleaned; the supply of food is regulated by an electro-plated stop-cork; the admission of air into the stomach is prevented; the teat is of very soft enamelled india-rubber, finely perforated to imitate the nipple, which can be instantaneously removed, washed, and wiped dry.

The same maker showed a very convenient Invalid Glass for Drinking while Reclining.

FORCEPS.

I. Midwifery.

No better evidence of the value of the forceps as an obstetric instrument could be adduced than was afforded by the number of the specimens exhibited, the celebrity of the inventors, and by the amount of ingenuity displayed in the various and ingenious modifications to meet the ordinary difficulties and special peculiarities of individual cases. In drawing up this report, great care has been taken to secure accuracy of detail upon all essential points, either by correspondence with the inventors themselves or with the instrument makers who were employed by the inventors. In one case only was the information supplied by an instrument maker imperfect, as will be seen by the accompanying table.

BRITISH

No.	Date.	Inventor.	Exhibitor.	Length of forceps.	Length of blade to lock.	Length of blade to commencement of curve.	Length of fenestrum.	Breadth of blade.	Divergence of apices.
1		Barnes	Weiss	15	$9\frac{3}{4}$	$6\frac{3}{4}$	$4\frac{1}{2}$	2	1
2	1842	Beatty, T. E.	Beatty, T. E.	$12\frac{1}{2}$	8	$7\frac{1}{2}$	$5\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{8}$
3		Bird, Fred.	Pratt	14	9	$5\frac{3}{4}$	$3\frac{3}{4}$	2	$\frac{3}{4}$
4		Blundell	Weiss	14	$8\frac{1}{4}$	$6\frac{3}{4}$	$4\frac{1}{4}$	$1\frac{3}{4}$	$\frac{7}{8}$
5	1751	Burton	Cory	$12\frac{1}{2}$	$4\frac{1}{4}$	$4\frac{1}{4}$	$3\frac{1}{2}$	$2\frac{1}{4}$	nil
6	1658	Chamberlen	Ferguson	12	$8\frac{1}{2}$	7	1–5 1–$6\frac{1}{2}$	$1\frac{5}{8}$	$\frac{7}{8}$
7	„	Ditto	Ditto	$12\frac{1}{2}$	8	7	5	$1\frac{3}{4}$	$1\frac{1}{8}$
8		Churchill	Weiss	$14\frac{1}{2}$	$8\frac{1}{4}$	$6\frac{3}{4}$	$4\frac{1}{2}$	2	1
9		Collins	Coxeter	$10\frac{1}{4}$	$5\frac{5}{8}$	$5\frac{1}{8}$	$3\frac{1}{2}$	$1\frac{3}{4}$	1
10		Conquest	Durroch	$13\frac{1}{4}$	$7\frac{3}{4}$	7	$5\frac{1}{4}$	2	$\frac{7}{8}$
11		Davis, David	Davis, J. Hall	$12\frac{1}{4}$	$6\frac{7}{8}$	7	$5\frac{1}{2}$	$1\frac{5}{8}$	$\frac{3}{4}$
12		Ditto	Ditto	$12\frac{1}{2}$	$8\frac{1}{2}$	$7\frac{3}{8}$	$5\frac{1}{2}$	$1\frac{3}{4}$	$\frac{3}{4}$
13		Ditto	Ditto	$14\frac{3}{4}$ 12	$10\frac{3}{4}$ $7\frac{3}{8}$	$7\frac{1}{4}$ 4	nil $3\frac{1}{8}$	2 1	—
14		Ditto	Ditto	$11\frac{1}{2}$ 10	7 $5\frac{1}{2}$	5 4	4 $2\frac{3}{4}$	$\frac{7}{8}$ $\frac{3}{4}$	$2\frac{1}{4}$
15		Ditto	Ditto	$11\frac{1}{2}$ 10	7 $5\frac{1}{2}$	5 4	4 $2\frac{3}{4}$	$\frac{7}{8}$ $\frac{3}{4}$	$2\frac{1}{4}$

FORCEPS.

Greatest divergence of blades.	Pelvic curve.	Form of lock.	Form of handle.	Remarks.
3	2¼	Ordinary shank ring	Wood, straight, rough	
3	Straight	Ordinary	Wood, straight, smooth	Weight 10¼ oz.; 'Dublin Med. Journ.,' July, 1842. Murphy, fig. 15.
3	Ditto	Ordinary shank ring	Ivory, straight, smooth	
2⅞	Ditto	Ordinary	Wood, straight, smooth	
2¼	Ditto	Rack and pinion	Steel bow	Churchill, plate vi, figs. 6—9.
3⅝	Ditto	Hole for tape	Iron bow	Murphy, fig. 1.
3	Ditto	Ditto	Ditto	
3	⅞	Ordinary	Wood, straight, indented	Murphy, fig. 17.
2⅞	Straight	Ditto	Wood, straight, smooth	Murphy, fig. 6.
2⅞	Ditto	Ordinary curved perineal shanks	Wood, straight, smooth, screw handle	Murphy, fig. 5.
2½	Curved	Ordinary shank	Wood, straight, smooth	Churchill, plate xiii, figs 1—5.
2¾	—	Ditto	Ditto	
—	—	Ditto	Ditto	
2⅞	—	Ditto	Ditto	
2⅞	—	Ditto	Ditto	

No.	Date.	Inventor.	Exhibitor.	Length of forceps.	Length of blade to lock.	Length of blade to commencement of curve.	Length of fenestrum.	Breadth of blade.	Divergence of apices.
16	1786	Denman	Weiss	11½	6½	6¼	4¼	1¾	⅞
17		Duncan	Young	13	8⅝	6½	4½	1¾	⅞
18	1863	Gayton	Gayton	12	7½	7	4½	1⅝	⅞
19		Giles	Giles	11½	7	7	4½	1⅝	1
20	1839	Greenhalgh	Weiss	11	7⅝	6¼	4¾	1¾	1⅛
21	„	Ditto	Ditto	11½	8¼	6½	5	2	1⅛
22	1852	Ditto	Ditto	13	9½	7	5	2	1
23		Haighton	Durroch	11¾	7	7	4⅝	2⅕	⅞
24	1775	Hamilton	Ditto	12¼	7	6¾	4¼	1¾	⅞
25		Harper	Pratt	14	9	6½	4½	2	1¾
26	1861	Hewitt, G.	Weiss	13	8	8	5	1½	½
27		Hopkins	Coxeter	12¼	7½	5⅝	4¼	2¼	⅞
28	1760	Johnson, W. R.	Cory	12¾	7½	7¼	5½	1⅝	⅝
29		Lever	Coxeter	14	9¾	6¼	4½	1⅞	¾
30		Lowder	Cory	11¼	6	5¾	4⅝	1¾	1⅛

Greatest divergence of blades.	Pelvic curve.	Form of lock.	Form of handle.	Remarks.
$2\frac{7}{8}$	Straight	Ordinary	Wood, straight, smooth	Churchill, plate x, figs. 3, 4.
$2\frac{7}{8}$	$1\frac{1}{4}$	Ordinary, "very easy"	Wood, straight, "conical digital groove"	
3	Straight	Ordinary, one side only	Wood, straight, smooth, spring rack at extremity	
$3\frac{1}{3}$	2	Ditto	Wood, straight, smooth, hinge in handle	
3	Straight	Ordinary ring	Ivory, straight, rough, short	
3	$2\frac{1}{6}$	Ditto	Ditto	
$2\frac{3}{4}$	3	Ordinary shank ring	Ivory, curved, rough, short	
$2\frac{7}{8}$	Straight	Ordinary	Wood, straight, smooth	
$2\frac{7}{8}$	$\frac{1}{6}$	Ditto	Wood, straight, smooth, one to turn back	Murphy, fig. 13.
$3\frac{1}{4}$	$2\frac{1}{6}$	Ziegler's	Ivory, straight, rough, finger rests	
$2\frac{3}{4}$	Straight	Ordinary	Wood, straight, rough	
$2\frac{3}{4}$	1	Ordinary ring	Wood, straight, smooth	Murphy, fig. 18.
$2\frac{1}{2}$	$\frac{3}{4}$	Ordinary	Ditto	Churchill, plate vii, figs. 9, 10.
3	$2\frac{3}{4}$	Ordinary shank ring	Ditto	
3	Straight	Ordinary	Ditto	

No.	Date.	Inventor.	Exhibitor.	Length of forceps.	Length of blade to lock.	Length of blade to commencement of curve.	Length of fenestrum.	Breadth of blade.	Divergence of apices.
31		Meadows	Meadows	13½	8½	6½	4¼	1¾	⅞
32		Murphy	Coxeter	12½	8	6	4	1⅞	1
33		Oldham	Weiss	13½	8½	6½	4	1⅞	⅞
34	1825	Radford	Radford	14¾	9	6⅜	5	2 1/16	1⅛
35		Ditto	Ditto	13¾	10¾	7¼	5¼	2⅛	1¼
				13	9¾	6½	5¼	2⅛	1¼
36		Ditto	Ditto	13½	10¾	7¼	5⅞	2⅛	1⅛
				13½	10¾	7¼	5⅞	2⅛	
				13	10	6¼	5¼	2⅛	1¼ oblique
37		Ramsbotham, F.	Ferguson	13	8⅜	6¼	4½	1⅞	1
38		Robertson	Robertson	14	7	7	4	1⅞	1
39		Simpson	Young	13½	8	6½	4¼	1¾	⅞
40	1752	Smellie	Cory	11¼	6½	6¼	4½	1½	⅛
41		Walter	Durroch	14	8½	6½	3½	1⅞	⅞
42		Ziegler	Weiss	13¼	8¾	6⅝	4½	1¾	⅞

Greatest divergence of blades.	Pelvic curve.	Form of lock.	Form of handle.	Remarks.
2⅞	1¼	Ordinary	Wood, straight, smooth, finger rests	
3	Straight	Ordinary shank	Wood, straight, rough	
3	2	Ditto	Wood, straight, smooth, square tops	
2¾	1½	Ditto	Wood, straight, smooth, short	
3 3	Straight	Ordinary ring	Ditto	
3 3	3	Ordinary shank ring	Wood, straight, smooth	
3	1⅞	Ordinary shank	Wood, straight, rough	Ramsbotham, 'Obstet. Med.,' 3rd ed., p. 282.
3	Curved	Ordinary	Wood, straight, smooth	
3	2	Ordinary shank	Wood, straight, indented finger rests	Shifting blades for pocket. Murphy, fig. 14.
2¼	Straight	Ordinary	Wood, straight, smooth	Churchill, plate vii, figs. 1—4.
2⅞	Ditto	Ordinary shank	Ditto	
3	Ditto	One double shank, one single to slide into first	Ditto	

CONTINENTA

No.	Date.	Inventor.	Exhibitor.	Length of forceps.	Length of blade to lock.	Length of blade to commencement of curve.	Length of fenestrum.	Breadth of blade.	Divergence of apices.
1		Assalini	Lollini	16	$\left\{\begin{matrix}8\frac{1}{2}\\9\frac{1}{4}\end{matrix}\right\}$	$6\frac{1}{2}$	nil	$1\frac{1}{2}$	
2		Baudelocque	Radford	$18\frac{1}{2}$	$10\frac{1}{2}$	$7\frac{1}{2}$	6	$2\frac{1}{8}$	
3		Busch	Priestley	$14\frac{1}{2}$	$7\frac{1}{2}$	6	$3\frac{7}{8}$	$1\frac{3}{4}$	
4		Campbell	Charrière	16	—	$6\frac{1}{2}$	—	$2\frac{1}{4}$	
5	1835	Cazeau	Lüer	18	$9\frac{1}{4}$	7	$5\frac{5}{8}$	$2\frac{1}{8}$	
6		Cederschjöld	Stillé	$15\frac{1}{2}$	$9\frac{1}{2}$	7	4	$1\frac{3}{4}$	
7		Charrière	Charrière	18	—	$6\frac{3}{4}$	—	2	
8		Chassagny	Ditto	18	10	7	5	$1\frac{1}{2}$	nil
9		Chassagny	—	—	—	—	—	—	—
10		Duse	Durroch	16	$\left\{\begin{matrix}7\\8\frac{1}{2}\end{matrix}\right\}$	6	nil	$1\frac{1}{2}$	$1\frac{1}{2}$
11		Faye	Lüer	18	$9\frac{1}{8}$	$7\frac{1}{2}$	$5\frac{3}{4}$	2	
12		Hardon	Hardon	—	—	—	—	—	—
13		Hennig	Hennig	$14\frac{1}{2}$	$8\frac{1}{2}$	$6\frac{1}{4}$	$4\frac{3}{4}$	2	
14		Hoffmann	—	—	—	—		—	—

FORCEPS.

Greatest divergence of blades.	Pelvic curve.	Form of lock.	Form of handle.	Remarks.
$2\frac{3}{8}$	$5\frac{3}{4}$	Tenon and mortise	Steel, lock at lower extremity	
$2\frac{3}{4}$	$3\frac{1}{2}$	Button screw	Steel, bow, two blunt hooks	
$2\frac{1}{2}$	$2\frac{5}{8}$	Ordinary one side	Wood, straight, smooth, finger rests	Black japanned, very heavy.
3	Straight & curved	Button screw	Wood, straight, rough	Charrière's 'Catalogue,' p. 119, fig. 364.
$2\frac{3}{4}$	$2\frac{1}{2}$	Pivot	Steel, blunt hooks	
3	$2\frac{3}{4}$	Ordinary one side	Wood, straight, rough, finger rests	
$2\frac{5}{8}$	Curved	Button screw	Steel, blunt hooks, shifting handles	Ditto, p. 120, fig. 309.
$2\frac{1}{2}$	$3\frac{3}{8}$	Ditto	—	
—	—	—	—	
$3\frac{7}{8}$	Straight	Raised button screw	Steel, blunt hooks	Churchill, plate iv, fig. 7.
$2\frac{1}{4}$	$1\frac{3}{4}$	Pivot	Ditto	
—	—	—	—	
3	$2\frac{3}{4}$	Ordinary	Wood, straight, smooth	
—	—	—	—	

No.	Date.	Inventor.	Exhibitor.	Length of forceps.	Length of blade to lock.	Length of blade to commencement of curve.	Length of fenestrum.	Breadth of blade.	Divergence of ap. ces.
15		Hügenberger	Hügenberger	13	8	5½	4½	1¾	1
16		Huevel, Van	Weiss	20½	10	10	4⅝	1⅝	1
17		Joërg	Hennig	13	7½	6	4½	1¾	
18		Krassovsky	Hügenberger	16	9½	8½	5½	1¾	
19		Lazaréwitch	Lazaréwitch	13¼	—	7¾	4½	2	
20		Levret	Hügenberger	15¾	8½	7¼	5½	2	
21		Levy	Nyrop	17	10	6½	5	1½	
22		Lovati	Lazzati	18	9¼	6½	5½	2	
23		Martin	Lüer	14	9	9	5	1⅞	
24		Mattei	Mattei	11	9½	6	6	2¼	1
25		Ditto	Ditto	14¾	7	6	4¾	1¾	
26		Mesuard	Cory	13	—	6½	5⅛	2⅛	
27		Mondotte	Mondotte	11	10	6	5½	2	
28		Nægele	Lüer	15	8½	8½	4½	1¾	
29		Nivet	Charrière	17	—	6	—	1¾	

Greatest divergence of blades.	Pelvic curve.	Form of lock.	Form of handle.	Remarks.
3¼	2¼	Ordinary	Wood, straight, finger rests	
2⅝	2⅞	Slotted pivot	Steel, straight, fluted	Chain saw in blades. See Decapitators.
2¾	2⅜	Ordinary one side	Wood, straight	
3¼	3	Ditto	Wood, straight, smooth, finger rests	
3	3¼	Tenon and mortise	Steel, fluted, rectangular ends	
2⅝	3½	Button screw	Wood, straight, smooth, extremities tipped with iron	Churchill, plate ii, figs. 1—5.
2¾	4¼	Ordinary	Wood, straight, finger rests, fold in handle, folding blades	
2¾	3	Pivot shifting	Steel, blunt hooks	
2½	3¾	—	—	
3½	4½	Hole in handle	Wood, rough, horizontal	
3¼	1¾	Shifting	Wood, rough horizontal, shanks parallel	Charrière's 'Catalogue,' p. 121.
3¼	Straight	Sliding lock in handle	Wood, straight, smooth	Churchill, plate v, fig. 8.
3	2¾	Holes in handles	Horizontal	
2¾	3½	Pivot	Wood, rough, finger rests	
2¾	—	Ditto	Steel - guarded crotchet and perforator	

No.	Date.	Inventor.	Exhibitor.	Length of forcep.	Length of blade to lock.	Length of blade to commencement of curve.	Length of fenestrum.	Breadth of blade.	Divergence of apices.
30		Pajot	Charrière	13¼	8½	6½	4¾	1⅞	1
31		Rizzoli	Rizzoli	17¾	9	7	5	2⅛	
32		Rizzoli	Rizzoli	17¾	9½	7	5½	1¾	
33		Rizzoli	Rizzoli	16⅛	8¾	7	5½	1¾	
34		Saxtorph	Nyrop	16	9	6½	5¾	1½	
35		Siebold	Hügenberger	15	8½	7½	2¾	1¾	
36	1843	Talatani	Lüer	18½	10½	7½	5⅝	2⅛	
37		Trelat	Ditto	16½	9½	7	4	2	

Blades.	Pelvic curve.	Form of lock.	Form of handle.	Remarks.
3	Curved	Button screw	Blunt hooks	
$2\frac{1}{4}$	$4\frac{1}{8}$	Ditto	Steel, curved blunt hooks, one at right angles	
$2\frac{5}{8}$	$3\frac{3}{8}$	Ditto	Steel, parallel, one blunt hook, one at right angles	
$2\frac{1}{4}$	$2\frac{3}{4}$	Ditto	Steel, parallel	
$2\frac{1}{2}$	$1\frac{1}{2}$	Ordinary	Wood, straight, rough, folding	Churchill, plate ix, figs. 8, 9.
$2\frac{3}{4}$	4	Button screw	Wood, straight, smooth, ends everted	Used for 30 years by Russian District Surgeons by order of the Government; used by Rechter, Sen., from 1790 to 1820.
$2\frac{3}{4}$	$2\frac{3}{8}$	Pivot	—	
3	$2\frac{1}{2}$	Ditto	Steel, rough, bowed, transverse steel for traction	

FORCEPS

No.	Date.	Inventor.	Exhibitor.	Length of forceps.	Length of blade to lock.	Length of blade to commencement of curve.	Length of fenestrum.	Breadth of blade.	Divergence of apices.
1	1783 to 1831	Unknown	Beatty, T. E.	11½	6½	6¼	5¾	1	
2	1700	Ditto	Cory	13	7½	7½	5	1½	nil
3	1752	Ditto	Cory	11½	6½	6	4¾	3⅛	
4		Ditto	Durroch	17	9¼	8	7	1¾	
5		Ditto	Lollini	19	10¾	8½	5	1¾	
6		Ditto	Merriman	7½	7¼	7¼	4¾	1⅛	1
7		Ditto	Smith, Tyler	17	7⅜	5¾	4¾	1⅝	
8		Japanese	Smith, Tyler	9½	4⅝	4⅜	4	¾	

UNKNOWN.

Greatest divergence of blades.	Pelvic curve.	Form of lock.	Form of handle.	Remarks.
3¼	Straight	Male and female	Wood, straight	Churchill, plate xii, figs. 3, 4. "A slit in one blade, just above the handle, permits the other blade to pass through; used in 125 cases by the late Dr. Beatty."
2½	2⅛	Ordinary	Ordinary	
2¾	Straight	Ditto	Ditto	
2	Ditto	Button screw	Steel, 1 blunt hook, 1 perforator	
2½	4⅝	Ditto		
2¾	Straight	Ordinary	Wood, smooth, finger rests	
2½	Ditto	Button screw	Iron, sharp rack extremities	
1¾	Ditto	Square groove	Iron, straight, extremities curved out	

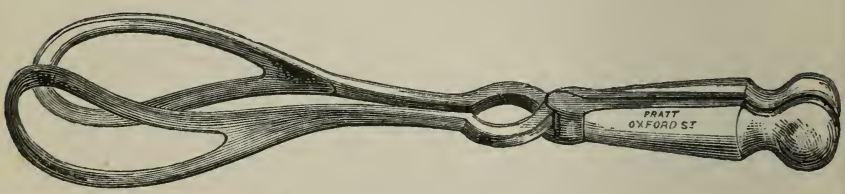
Glancing through this table, in alphabetical order, the following instruments appear to deserve some special notice.

Barnes's Forceps.—The inventor states "the ring formed by the union of the blades gives advantage of additional grasp, so that the two handles can be used *together or alternately*. The ring virtually lengthens the handle. The parallel shanks further give power by their length, and obviate all stretch on the perinæum."

Dr. Beatty's Straight Forceps are remarkable for their lightness, weighing only 11 oz., for the length of their blades, and for the slenderness of the arms of the fenestræ, which are not rounded out internally, so that their strength is not impaired. They were designed, described, and published by the inventor in the 'Dublin Medical Journal,' vol. xxi, in 1842.

Dr. Frederick Bird's Forceps are seen in this sketch (fig. 69). They have unusually wide and rather short fenestræ, long shanks, and a ring just above the handles, formed by the opposed shanks, for the finger, to facilitate in the process of extraction.

Fig. 69.



Campbell's Straight and Curved Forceps.—The peculiarity of these instruments is, that they can be used either as short or long forceps, by means of shanks which slide into the handles, and can be firmly fixed to any length by a catch on the upper and outer parts of each handle; they may also be used as finger-rests.

M. Charrière's Jointed Forceps.—The inventor and maker states, "The method of dismounting these forceps is very simple and solid, and permits also of the adaptation of the blades of various forms and sizes without augmentation of volume. See Charrière's Catalogue, p. 120, fig. 309.

Chassagny's Forceps, with apparatus for sustained and gradual traction and progressive compression.

Chassagny's small Pocket Forceps, for application when the head is at the inferior aperture of the pelvis.

Five pairs of Dr. D. Davis's Forceps were exhibited by Dr. J. Hall Davis.

1*st Pair.*—Common short broad-bladed, with one short blade, used in cases of prolapse of the funis.

2*nd Pair.*—Narrow-bladed, one used sometimes with broad blade.

3*rd Pair.*—Long forceps, with two blades of different lengths, one when the face is to the right, the other when the face is to the left, of the pelvis.

4*th* and 5*th Pairs.*—Oblique forceps.

Note.—On the authority of Dr. J. H. Davis, it is worthy of remark that the late Professor Davis was the inventor of the shank.

Davis's (Dr. D.).—With five blades, two broad double-curved with wide fenestræ—two narrow without fenestræ, also double-curved, and one short straight blade. These, adapted in their use to their special cases, actually form four pairs of forceps.

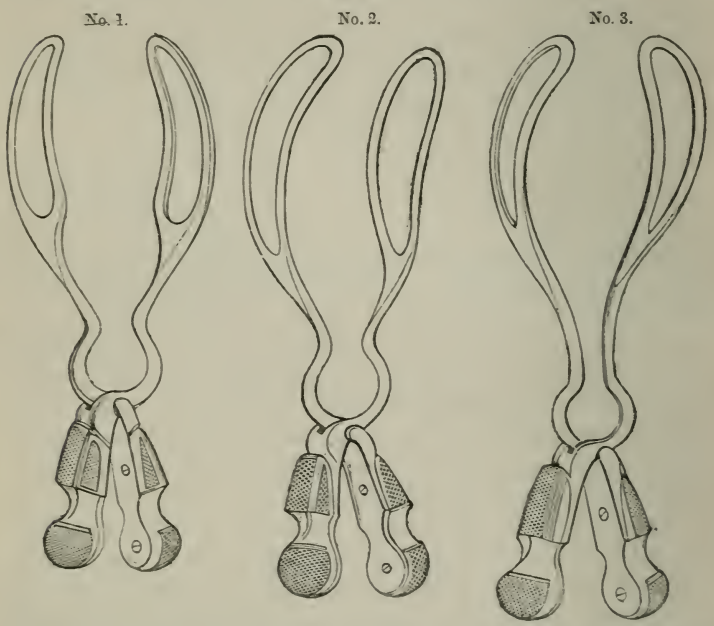
Davis's (Dr. D.).—Two pairs of (what Dr. Radford calls) twisted forceps for rectifying (as Dr. D. Davis says) the positions of the fœtal head. Each pair consists of two blades standing obliquely to each other, one shorter than the other. They should be covered with leather.

Dr. Gayton exhibited his Forceps, which are intended to obviate the injurious effects of continued pressure on the fœtal head, by means of a tape firmly secured round the handles, when it is within the grasp of the forceps. The inventor states, "My addition simply consists of a means of junction on the old rack-and-spring principle; on the one handle the rack and spring is placed, the other is flattened and tapered so as to be received into the furrows made for it. When the blades are applied and the instrument locked, it may be kept at any degree of compression by simply raising the spring and allowing the end of the handle to advance or recede as desired. In this way, during the interval of pain, the pressure is in a moment taken off the fœtal head, and as quickly replaced; nor do I believe does the addition in any material way interfere with the action of the instrument, especially if the rack be kept downwards." 'Medical Times and Gazette,' August 29th, 1863, pp. 217-18.

Dr. Giles's Forceps are short and curved, with a hinge adapted to the upper blade in such a manner that when they are locked the tail of the blade, which is hinged, is shut into the lock, and the blade cannot possibly shift until they are unlocked. The lock is formed in the usual manner on the blade that is hinged with a flange forming a groove $\frac{1}{2}$ an inch deep. The lower blade has no flange. The advantage in the hinge in the upper blade is, that the handle is thrown forward, and the blade can be introduced without altering the patient's position in the bed, of course presuming she is lying in the ordinary obstetric position.

Greenhalgh's (1) Short Straight, (2) Short Curved, and (3) Long Curved Forceps.—The inventor states "that his in-

Fig. 70.



struments are strong, light, and wieldy, and suited to any and all cases requiring the use of the forceps. The blades in the two former are not so broad at their terminal extremities as in the latter. The fenestræ are sufficiently open at their lower extremities to admit of the protrusion of a small portion of the scalp and

even bone, as in Dr. D. Davis's forceps, so that there is little or no addition made to the size of the head, and a firmer hold is thereby obtained; besides which the soft parts of the child are permitted to come in contact with the soft parts of the mother, thus preventing all risk of bruising during extraction. The blades are rounded out internally, and well adapted to grasp firmly a spherical or ovoid body. The handles are short and of roughened ivory, that shortness being compensated for by a ring for the insertion of the finger or towel, by the aid of which any amount of justifiable extractive force can be exerted, and the shank, in the long forceps, which also enables the operator to avoid undue distension and risk of laceration of the perinæum, besides the inclusion of any of the soft parts within the lock. In the long curved forceps the pelvic curve extends throughout the whole instrument, as in Nægele's forceps, by which a more perfect adaptability to the curve of the pelvis, without stretching the perinæum, is secured."

Hardon's Forceps.—The modification here consists in adapting a fixed pivot to the male and a narrow (button?) to the female branches.

Mr. Philip Harper's Forceps are peculiar in this respect, that one blade has a fenestra so long that the opposite blade can be passed through it, as will be seen by reference to the annexed illustration (fig. 71).

Fig. 71.

Hennig's Forceps.—The inventor states that his instrument is constructed on three principles, embodying—

1st. The pelvic curve of Joerg's forceps.

2nd. The shank of Dr. Hohl, to avoid too great stretching of the perinæum.

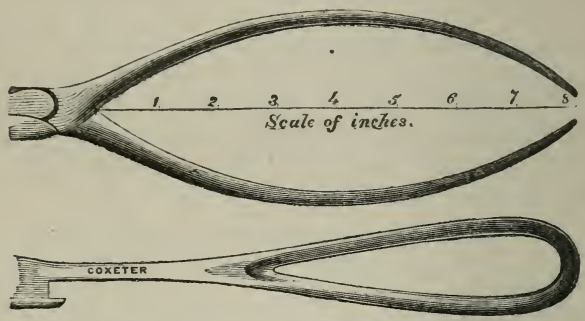
3rd. The hooked handles, copied from the forceps of the Prague School.

Hewitt's (Graily) Forceps.—The inventor claims for his

instrument greater facility of introduction and better adaptation to the fœtal head than can be secured by the ordinary forceps in cases where, from severe labour, the occipito-mental diameter is much elongated.

He states that his "instrument only differs from the common straight forceps in use in this country in having longer blades, and in the blades themselves having a different curve. The length of the blades is 8 inches instead of $6\frac{1}{2}$ or 7, and the curve is an arc of a circle 14 inches in diameter, instead of 10 or 11 (fig. 72).

Fig. 72.



The instrument when locked is fitted to enclose a larger oval than the ordinary forceps." (See 'Obstet. Trans.,' vol. iii, p. 190.)

Hoffmann's Long Forceps, with shank and ring for finger or handkerchief.

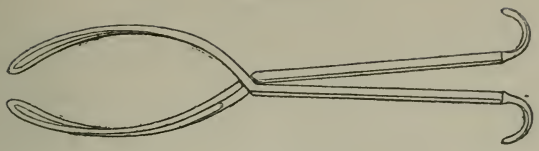
Forceps of the Prague School (1820), modified by Professor Krassovsky, of St. Petersburg, exhibited by Professor Hugenberger, who states that this instrument has Busch's lock, and was used by Professor Krassovsky as short or long forceps. He also used them as a tractor before and after perforation of the head, in cases of distorted pelvis, where the child was dead.

The Japanese Forceps are chiefly remarkable for the shortness ($4\frac{3}{4}$ inch), narrowness of ($\frac{3}{4}$ inch), and distance ($1\frac{3}{4}$ inch) between the blades, also for the straight fenestræ.

The lock is peculiar, being formed by an aperture $\frac{1}{4}$ of an inch in length and the same in depth, slanting upwards in each limb of the instrument at the junction of the blade with the handle.

They are made of steel, the blades being rounded off and polished, the handles square, black, and dull, terminating in two divergent flattened hooks (fig. 73).

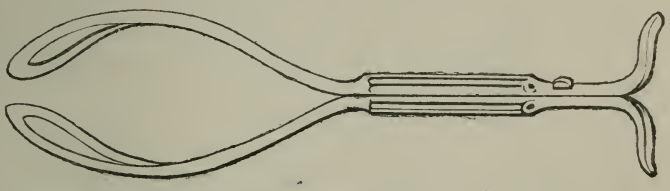
Fig. 73.



Lazaréwitch's Forceps.—The inventor claims for these the following advantages:

1st. That, owing to the halves not crossing, it is immaterial which blade is first introduced.

Fig. 74.



2ndly. Each half can be applied with equal facility, the first one introduced not being in the way of the second. The inventor considers this an especial advantage in cases where the head is high in the pelvis and the vagina imperfectly dilated.

3rdly. The lock being in the handle, there is no fear of pinching the soft parts or including hairs.

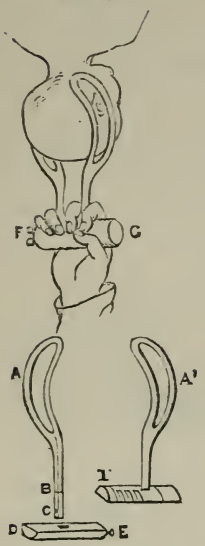
4thly. That when considerable contractive force is necessary all hazardous pressure on the fœtal head may be avoided.

Levy's (Copenhagen) Forceps, exhibited by Professor Nyrop, who describes this instrument "as a combination of the blades of Nægele with the handles of Saxtorph, with small jointed wings to support the fingers. The handles fold up upon the blades. These forceps are in general use in Denmark." (See fig. 75.)

Fig. 75.

Mattei's Leniceps, or Short Curved Forceps, are here represented (fig. 76).

Fig. 76.

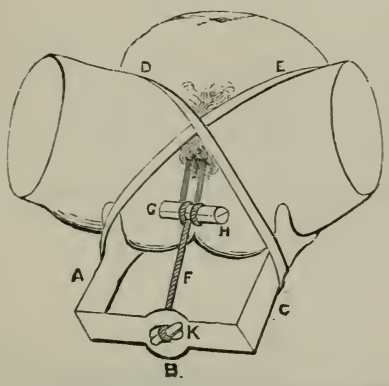


A Represents the left blade. B. The shank, the corner extremity of which (C) slides into the hole in the lower half of the handle (D), where it is fixed by a spring pivot running from E to D. A'. The right blade fastened into the upper half of the handle, at the inner extremity of which are several steel notches (I) for the reception of the opposite shank (B), by which the distance between the blades can be regulated. F G Shows the upper and under halves of the rough wooden handles joined, the application of the instrument to the fœtal head, and the method of traction.

Mattei's leniceps come within the principle of Assalini's and Lazaréwitch's forceps—the blades not crossing, and therefore not exercising compressive force.

Where prolonged and forcible traction is required, M. Mattei has constructed a square framework of steel, A, B, C (fig. 77), having on both sides, at its upper extremities, two excavations for the reception of the patient's thighs, to the under surface of which the apparatus is to be firmly secured by straps (D, E) crossing in front of the pubes, and passing over the hips to the back, where they are to be fastened.

Fig. 77.

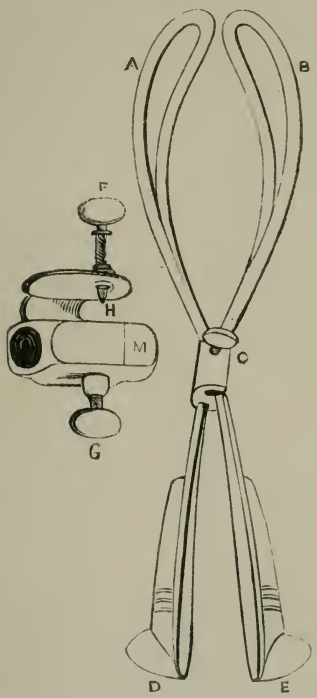


The leniceps being applied, M. Mattei attaches a rope (F) to the transverse handle (G, H), while the other end is fixed to the screw (K), by turning which forcible traction upon the forceps can be effected over a considerable period.

Mattei's Long Curved Forceps, with movable articulation and lock, 1855, are represented in fig. 78.

A, B, C, D, E, represents the instruments articulated. F, G, H, L, M, represents the articulation. The blade (B, D) is received into the hole (L, M), and moves along it unless arrested by the screw (G). The blade (A, E) is received into the groove (H), and there fixed by the screw (F). At C the lock is seen fixed; the movable screws (F and G) admit of the lock being moved up or down the blades.

Fig. 78.

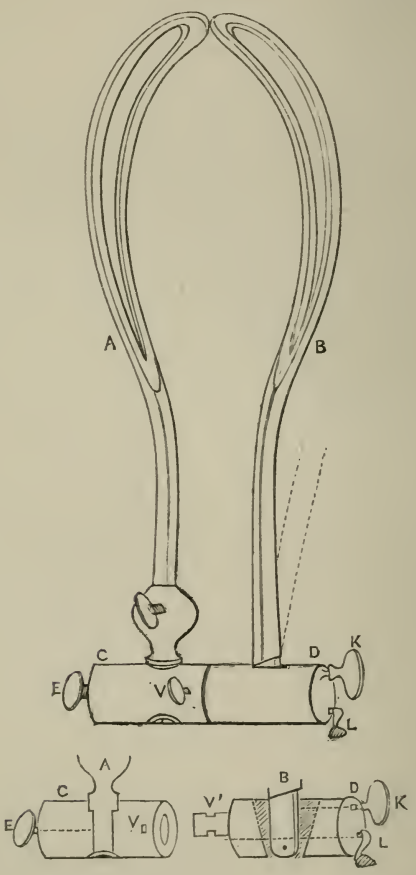


A pair of Short Forceps, inventor unknown, but used by the late Dr. Samuel Merriman, were exhibited by his son Dr. S. W. J. Merriman, who remarks—"There is a straight piece of steel with a cross-piece attached to the end, which, by means of a slide, was placed uniform with the straight piece or made to stand out like a T; this was intended, I understand, to be used to

bring through the pelvis the head after perforation, but was of very little practical use." Dr. Merriman concludes—"These forceps were the only kind used by my father, as he invariably declined to use the long forceps, believing them to be injurious or unsafe."

Mondotte's Forceps are represented in this sketch (fig. 79). The inventor thus describes them:

Fig. 79.



A. Is the pivot blade. B. The hinge blade. C, D. Two halves of the handle, each carrying a blade, articulating with one another

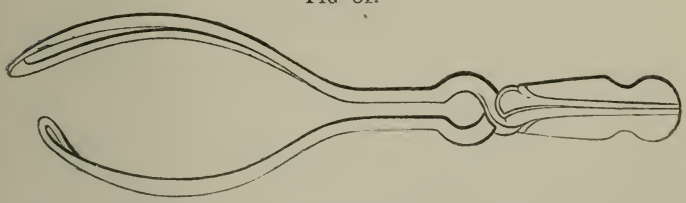
by introducing the tenon into the mortice, fastened by the screw (v) which enters the groove (v′). E. The screw which prevents the movement of rotation of blade A. H. The screw which raises the blade B, and enables the operator to seize the head without compression. L. The screw which presses against the opposite handle (C), and arrests the rotation of the two handles.

The screws not being used till after the introduction and articulation of the forceps, all the difficulties of locking his instrument disappear. The inventor also draws special attention to the following points—the parallel handles; the locks not crossing; the blades not compressing the head; the distance between the blades can be regulated by shifting the handles.

Dr. Radford's Straight Long Forceps, with blades of unequal length—reversed position of the lock. The annexed sketch (fig. 80) represents one of the blades just described, and is intended to show the form of fenestræ, lock, &c. Fig. 81 shows the blades locked.

Fig. 80.

Fig 81.

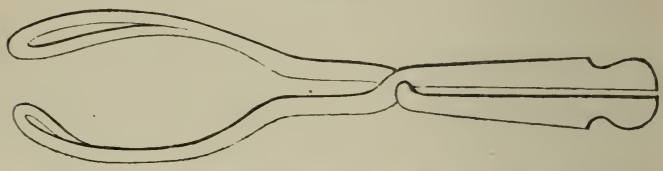


The inventor says — The peculiarities of this instrument are the long and short blade, the former to be placed over the face, the latter on the occiput of the infant. It is sufficiently long to be applied on the head when it is lying on or just entering the brim of the pelvis. The shortness of the handles renders violent compression of the infant's head quite impossible. Its construction is adapted more especially to that of a powerful tractor. The oblong opening formed by the curve in the shank of each blade is for the purpose of passing a silk handkerchief through, and will enable the practitioner, in addition to his hold of the handles,

to use very powerful and effective extractive force. The reverse position of the locks supersedes the necessity of all contrivances, such as screw or hinge, between the handle and that blade which (according to the usual construction) is placed on the upper side of the pelvis, and is the one to be the last introduced. Whereas the position of the lock in this instrument requires that the upper blade (assuming the woman lies on the left side) should be first introduced.

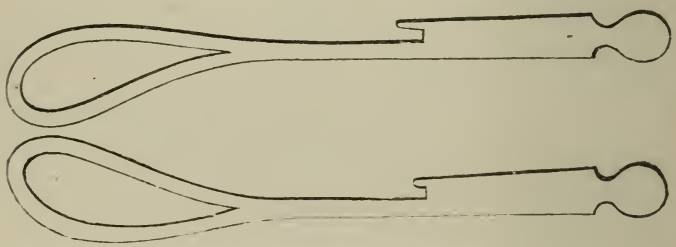
Dr. Radford's Long Curved Forceps, with equal blades, are here shown (fig. 82).

Fig. 82.



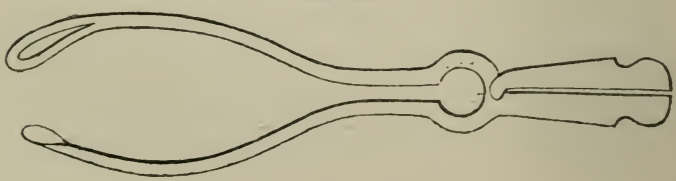
The inventor states that the object of the parallel shanks is to prevent injurious stretching of the perineum and risk of laceration of the pelvic structures. Fig. 83 represents the two blades of Dr. Radford's long curved forceps just alluded to.

Fig. 83.



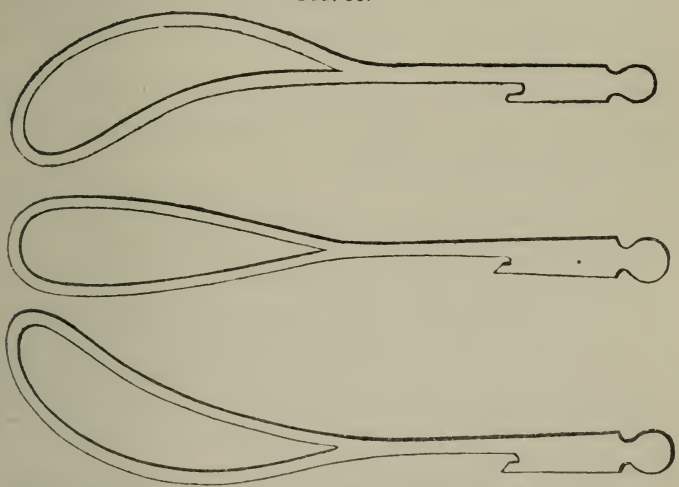
Dr. Radford's Long Double Curved Forceps consists of three blades, two of equal length and double-curved, the other shorter and straight. Fig. 84 represents the blades locked and in position.

Fig. 84.



Dr. Radford remarks — The double-curved long forceps are preferred by many practitioners, but this is not the case with the inventor. His object was to meet the views of others. This instrument is similarly constructed to the straight, already described, with the exception of the double-curved long blades, and as consisting of three blades, one being shorter than the other and straight. One of the long double-curved is to be placed over the face and the short (straight) one over the occiput of the infant. It will be quite obvious that two long double-curved blades are required, not to be used together, but in order to apply one or the other, according to the relative position of the face of the infant, as the *shorter* straight is to be invariably placed on the occiput. Fig. 85 represents the three blades just described.

Fig. 85.



The following Forceps were displayed by Dr. Radford.

Long Forceps.

Conquest's, with perineal curves in shanks, and a screw in one handle.

Davis's (D. D.).—With three blades—two long ones, flexible at their extremities, having the pelvic curve. These blades ought to be covered with leather and padded with flannel. They are intended to lay over the face. There is also a shorter straight blade to lay over behind the head.

Short Forceps.

Boer's double-curved, blunt hook at the handle—lock, an oblong projection on one blade received into a mortice on the other.

Denman's straight.

Haighton's.—Fenestræ slightly modified from his short straight forceps.

Hamilton's double-curved, hinge in one blade.

Johnson's (R. W.) double-curved, not covered with leather.

Orme's straight.

Smellie's straight, and covered with leather.

Professor Rizzoli exhibited three pairs of different sizes of Long Double-curved Forceps.

1*st Pair.*—Blades very narrow and tapering at their extremities, fenestræ long and narrow; handles flat, straight, lying upon and parallel to each other; terminating in a blunt hook, and hook at right angles.

2*nd Pair.*—With three blades broader, fenestræ wider; handles crossed like a pair of scissors, and broad, terminating in a blunt hook, and hook at right angles.

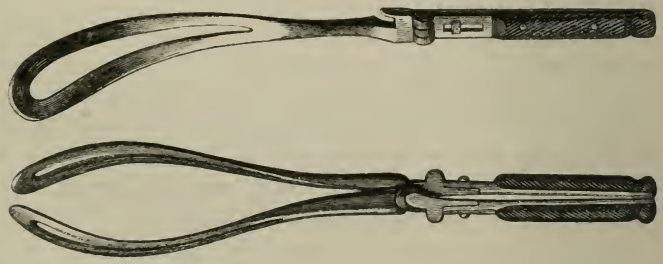
3*rd and smallest Pair.*—Blades narrow and tapering; handles flat, and superposed like the first pair; forceps key with a terminal and central slit for turning the buttons of the locks.

Osborne's (supposed to be) double curved, about half an inch longer than Osborne's, which they closely resemble.

Pajot's Jointed Forceps resemble Charrière's, already referred to, but have at one extremity of the handle a blunt hook, at the other a thread of silk, terminated by a leaden ball, for the purpose of embryotomy, as recommended by the inventor. (See Charrière's Catalogue, p. 120, fig. 308.)

Saxtorph's Forceps (1819), were exhibited by Professor

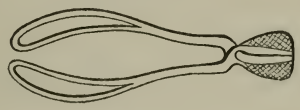
Fig. 86.



Nyrop, who particularly draws attention to the small pelvic curve and to the fact that they are still used by most of the old practitioners in Denmark. They are represented in fig. 86.

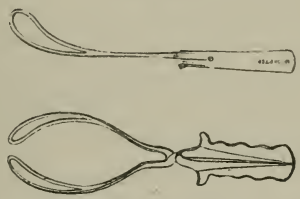
Sir James Simpson's Short Forceps are here seen (fig. 87). The handles are very short, and when locked the shanks of the blades are so apart that the finger can be placed in the space between them to facilitate the process of extraction.

Fig. 87.



Sir James Simpson's Long Forceps are here shown (fig. 88). The peculiarities are seen in the shape of the handles, and in the hook at the top of each for the fingers to aid in extraction.

Fig. 88.



M. Stille also exhibited a Forceps for holding and passing a rope round a polypus when situated high up. It consisted of a small steel rod, 16 inches with the handle in length, having a small hook-like end. About 4 inches from this is a hinge by which is fixed a rod with similar end. The two hooks, when closed together, form a ring through which a rope can pass. The second and shorter rod is kept closed by means of a spring pressing against the other side. When it is required to release the rope, pressure is made on the lower end of the second rod.

Unknown, steel handles and with blunt hook.

Unknown.—Double curve, one blade has a longer fenestra than the other, through which the one with the shorter fenestra is to be passed—when fully applied the two blades should lie parallel, they are then locked.

One pair of double-curved forceps.

Unknown (T. Smith).—These forceps have the limbs of the

blades covered with leather, the fenestræ being open: they are remarkable for the indentation in the upper extremity of each blade which is rendered square by the leather covering, by the abruptness of the fœtal curve, by the shifting button-lock, and the divergent handles terminating in converging sharp hook extremities.

They resemble Duse's forceps in the indentation at the upper and terminal extremity of the blade, and Gifford's and Chapman's in the shape of the handle.

Unknown.—One very short pair, wide fenestræ, scarcely any shanks.

To sum up this report, then, we may remark that the chief peculiarities of *British* forceps may be pointed out under the following heads:

1. *As to length.*—The longest (Barnes), were 15 inches; the shortest (Collins), $10\frac{1}{4}$ inches; the average lengths varying in the following order of frequency—14, $11\frac{1}{2}$, $12\frac{1}{2}$, 13, $13\frac{1}{2}$ inches, the first being the most frequent.

2. *Length of blade to lock.*—The longest (Davis, D., and Radford), $10\frac{3}{4}$ inches; the shortest (Burton), $4\frac{1}{4}$ inches; the average lengths varying in the following order of frequency—7, 8, $8\frac{1}{2}$, $10\frac{3}{4}$, the first being the most frequent.

3. *Length of blade to commencement of curve.*—The longest (G. Hewitt), 8 inches; the shortest (Burton), $4\frac{1}{4}$; the average lengths varying in the following order of frequency—7, $6\frac{1}{2}$, $6\frac{1}{4}$, $7\frac{1}{4}$, the first being the most frequent.

4. *Length of fenestrum.*—The longest (Chamberlen), $6\frac{1}{2}$ inches; the shortest (Davis), $2\frac{3}{4}$ inches; no fenestrum (Davis); the average lengths varying in the following order of frequency—$4\frac{1}{2}$, 5, 4, $4\frac{1}{4}$, $5\frac{1}{4}$ inches, the first being by far the most frequent.

5. *Breadth of blade.*—The broadest (Burton), $2\frac{1}{4}$ inches; the narrowest (Davis), $\frac{7}{8}$ of an inch; the average breadths varying in the following order of frequency—$1\frac{3}{4}$, 2, $1\frac{7}{8}$, $1\frac{5}{8}$, the first being by far the most frequent.

6. *Divergence of apices.*—The shortest (Smellie), $\frac{1}{8}$th inch; the longest (Davis, D.), $2\frac{1}{4}$; no distance between (Burton); the average divergence varying in the following order of frequency—$\frac{7}{8}$ths, 1, $\frac{1}{16}$, $\frac{3}{4}$ths, the first being by far the most frequent.

7. *Greatest divergence of blades.*—The greatest (Chamberlen), $3\frac{5}{6}$ inches; the smallest (Burton and Smellie), $2\frac{1}{4}$ inches; the

average distances varying in the following order of frequency—3, $2\frac{7}{8}$, $2\frac{3}{4}$, the first by far the most frequent.

8. *Pelvic curve in forceps.*—The shortest (Hamilton), $\frac{1}{8}$th inch; the longest (Radford and Greenhalgh), 3 inches; the average amount varying in the following order of frequency—2, $2\frac{1}{8}$, $2\frac{1}{4}$, 3, $2\frac{3}{4}$, the first four being equal.

9. *Form of lock.*—Ordinary (Smellie's), 14; ordinary, with shanks, 11; ordinary, shanks with ring, 5; ordinary, with ring, 4; ordinary, one-sided, 2; hall for tape, 2; Ziegler's, 2; ordinary with curved perineal shanks, 1; rack and pinion, 1.

10. *Structure and forms of handles.*—Wood, 34; ivory, 5; iron, 3; smooth, 28; rough, 8; short, 5; long, 36; straight, 38; curved, 1; bow, 2; finger-rests, 5; hedged, 2; screw, 1; spring rack at extremity, 1; shifting handles, 1.

The chief peculiarities of *Foreign* forceps may be pointed out under the following heads:

1. *As to length.*—The longest (Van Huevel), were $20\frac{1}{2}$ inches; the shortest (Mattei and Mondotte), 11 inches; the average lengths varying in the following order of frequency—16, 18, and 13, the two former being more frequent and equal.

2. *Length of blade to lock.*—The longest (Baudelocque), $10\frac{1}{2}$ inches; the shortest (Mattei and Duse), 7 inches; the average lengths varying in the following order of frequency—$8\frac{1}{2}$, $9\frac{1}{2}$, 10, $9\frac{1}{4}$, 9, the first being most frequent.

3. *Length of blade to commencement of curve.*—The longest (Van Huevel), 10 inches; the shortest (Hugenberger), $5\frac{1}{2}$ inches; the average lengths varying in the following order of frequency—6, $6\frac{1}{2}$, 7, $7\frac{1}{2}$, the three former being equal and far more frequent than the latter.

4. *Length of fenestrum.*—The longest (Baudelocque and Mattei), 6 inches; the shortest (Siebold), $2\frac{3}{4}$ inches; no fenestrum (Assalini and Duse); the average lengths varying in the following order of frequency—$5\frac{1}{2}$, 5, $4\frac{1}{2}$, the first being the most frequent.

5. *Breadth of blades.*—The broadest (Campbell and Mattei), $2\frac{1}{4}$ inches; the narrowest (Assalini, Chassagny, Duse, Levy, Saxtorph), 12 inches; the average breadth varying in the following order of frequency—$1\frac{3}{4}$, 2, $2\frac{1}{8}$, $1\frac{1}{2}$, the first being far more frequent.

6. *Divergence of apices.*—The shortest (Faye, Levy, Lovati,

Nægele), $\frac{1}{5}$th of an inch; the longest (Pajot), $1\frac{3}{8}$ inches; no distance (Chassagny). The average divergence varying in the following order of frequency—$\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{1}{8}$, the first being most frequent, the two next equal.

7. *Greatest divergence of blades.*—The greatest (Duse), $3\frac{7}{8}$ inches; the smallest (Faye, Rizzoli, Losati), $2\frac{1}{4}$ inches; the average distances varying in the following order of frequency—$2\frac{3}{4}$, 3, $2\frac{5}{8}$ $2\frac{1}{2}$, $3\frac{1}{4}$, the two first being far more frequent, the three following equal.

8. *Pelvic curve.*—The shortest (Saxtorph), $1\frac{1}{2}$ inch; the longest (Assalini), $5\frac{3}{4}$ inches; the average amount varying in the following order of frequency—$2\frac{3}{4}$, $3\frac{1}{2}$, $2\frac{1}{2}$, $2\frac{3}{8}$, $1\frac{3}{4}$, $3\frac{3}{8}$, the first most frequent, the last four being equal.

9. *Form of lock.* — Button-screw, 11; pivot, 8; ordinary (Smellie), 4; ordinary, one-sided, 4; hall in handle, 2; tenon and mortise, 2; shifting, 1; sliding, 1.

10. *Structure and forms of handles.*—Iron, 15; wood, 14; rough, 7; smooth, 6; long, 31; parallel, 29; horizontal, 2; finger-rests, 6; fluted, 2; bow, 2; blunt hook extremities, 9; perforator at extremities, 1; rectangular extremities, 1; shifting handles, 1; folding handles, 1.

It now only remains to point out the chief peculiarities between British and Foreign forceps:

The British are shorter, lighter, and less powerful than the Foreign instruments; the former terminating usually in straight wooden, the latter in blunt-hook steel handles. Owing to the comparative shortness of the blades of the British forceps, the cranial curve is somewhat more abrupt than in the Foreign instruments, in which, when locked, the blades, both at their apices and greatest divergence, approximate more closely, by which far greater compression can be exerted on the fœtal head. There is a very slight difference between the breadth of the blades and fenestræ, which, however, are longer in the foreign instruments. The straight forceps rarely used in continental practice are not infrequently had recourse to by British practitioners, especially among the Irish. In the double curved forceps the pelvic curve is greater in the Foreign than in the British instruments.

There is also considerable difference in the form of locks, the ordinary double lock of Smellie greatly preponderating among British, whereas the button-screw and pivot are far more frequent

among continental practitioners. Thus it will be seen that the Foreign is a far more formidable instrument for compression and extraction than the British forceps.

As types of British forceps, the instruments of Chamberlen and Smellie; of Foreign, those of Levret, may be considered as good examples.

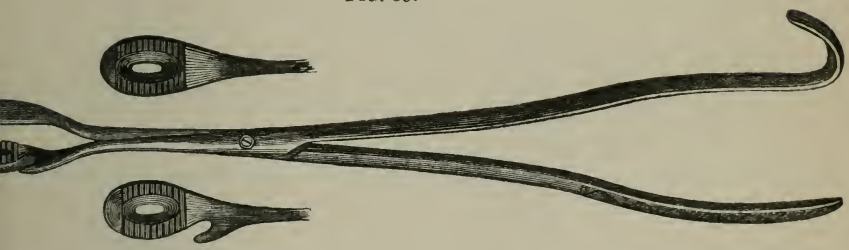
II. Foot Forceps.

The following Foot Forceps may be noticed:

1. Dr. Grönning's, invented in 1815, exhibited by C. Nyrop, Copenhagen.

2. Dr. Districtslæge, E. Nyrop's, invented in 1853, exhibited by C. Nyrop, Copenhagen, and is represented in this sketch (fig. 89).

Fig. 89.



3. Prof. Lazaréwitch's, of Charkoff, Russia, exhibited by himself.

Prof. Rizzoli exhibited two varieties of Foot-Forceps, of which the accompanying sketches are illustrations (figs. 90 and 91).

Fig. 90.

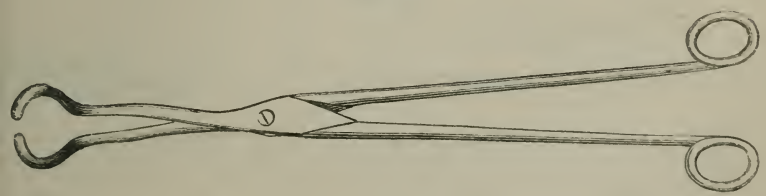
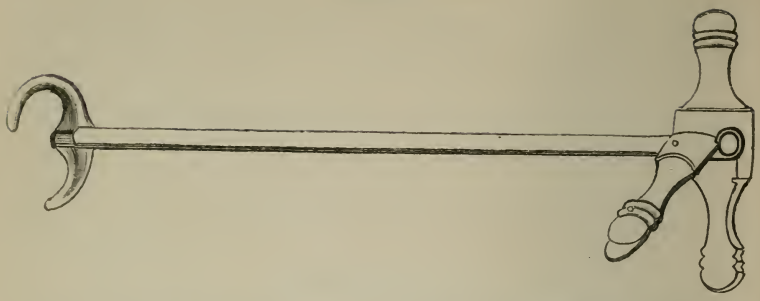


Fig. 91.



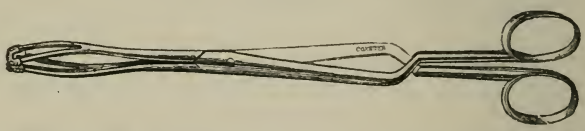
One of them works like a pair of ordinary scissors, the extremities of each blade forming the segment of a circle and being placed at a somewhat acute angle with the shaft. The other, as is seen, opens and shuts by an action of the handle which is communicated along the shaft of the instrument.

III. Miscellaneous.

Canulæ Vulsellum Forceps, containing two, three, or more arms as hooks, were exhibited by Dr. Greenhalgh and Messrs. Weiss and Ferguson.

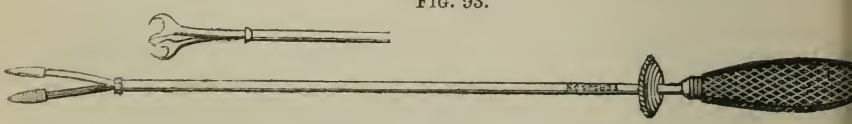
Mr. Coxeter also showed various Forceps for Uterine Operations, one of which is represented in this illustration (fig. 92).

Fig. 92.



Mr. Ferguson exhibited a pair of Canula Forceps or Vulsella, of which the annexed drawing gives an illustration (fig.

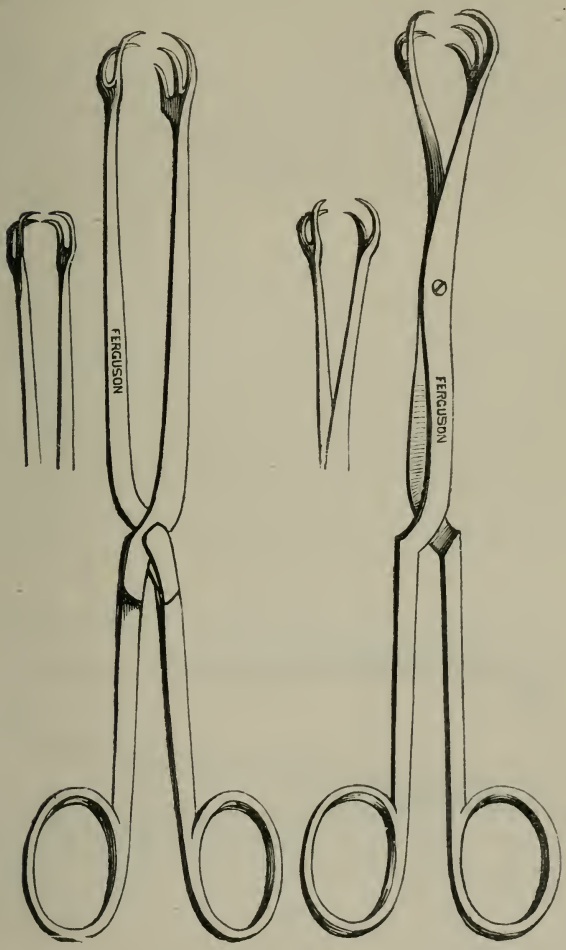
Fig. 93.



93). The canula slides up and down the handle, closing the blades and guarding the soft parts from injury in the passage of the instrument up to the body to be seized.

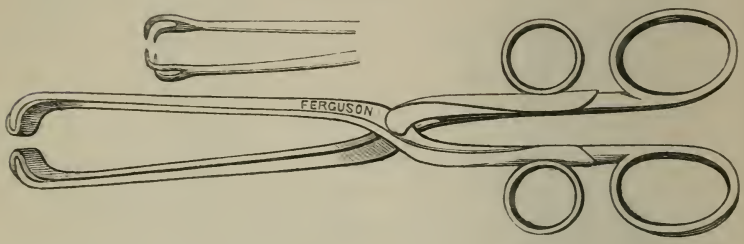
Ferguson also exhibited a pair of Museaux's Vulsellum Forceps, with two or three hooks, as represented in this sketch (fig. 94). The blades are fastened together in the ordinary way.

Fig. 94.



A pair of Guarded Vulsellum Forceps, made by Mr. Ferguson at the suggestion of Dr. Charles West, of which a representation is given below (fig. 95). The guard is of silver, and they were exhibited by the maker.

Fig. 95.

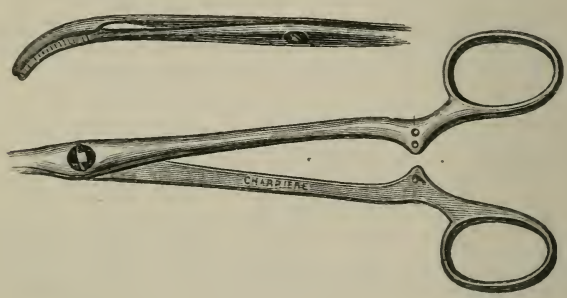


The same maker showed the Jointed Vulsellum Forceps of Sir James Simpson, the blades having two or more hooks. The lock was the same as that used in ordinary midwifery forceps.

A pair of Long Uterine Forceps, with rack in the handles to fix the blades, were exhibited by Lüer.

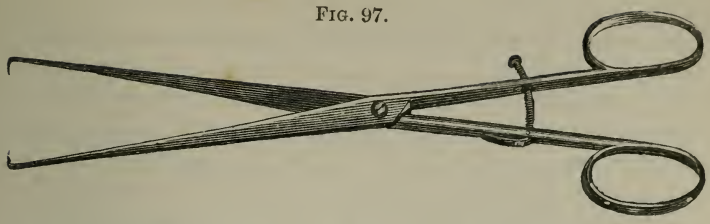
Messrs. Mayer and Meltzer exhibited a somewhat similar instrument, made by Charrière originally, at the suggestion of Dr. Marion Sims: it is represented in this sketch (fig. 96), and is called by Dr. Sims Polypus Forceps.

Fig. 96.



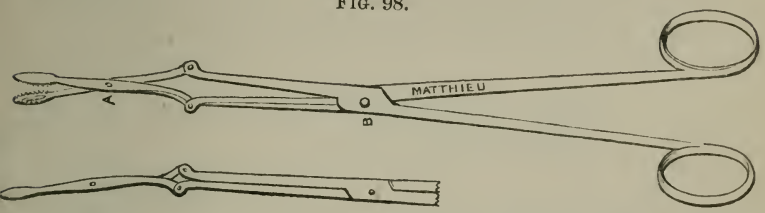
The same maker also showed Dr. Bennet's Double Tenaculum Forceps, for seizing the cervix uteri in cases of amputation. The accompanying sketch is an illustration of it (fig. 97).

Fig. 97.



A pair of Uterine Speculum Forceps, with treble joint, were exhibited as invented by Matthieu, and are represented below (fig. 98).

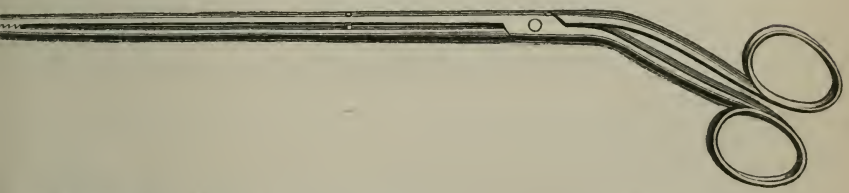
Fig. 98.



M. Matthieu also showed a pair of Polypus Forceps, furnished with a slide for the purpose of keeping the blades firmly closed, so as to avoid the tiring compression of the fingers.

Messrs. Maw and Son exhibited a pair of useful Speculum Forceps, which are represented in this sketch (fig. 99). The angle

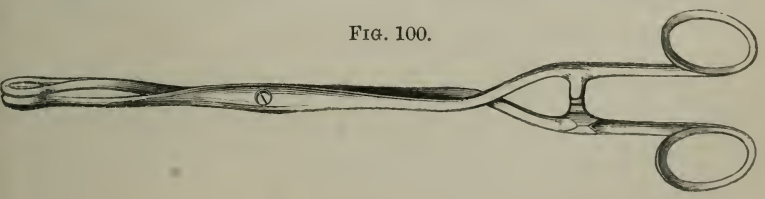
Fig. 99.



at which the handles are set enables them to be used without in any way interfering with the line of vision along the speculum.

Dr. McClintock's Fenestrated Forceps, for seizing uterine

Fig. 100.



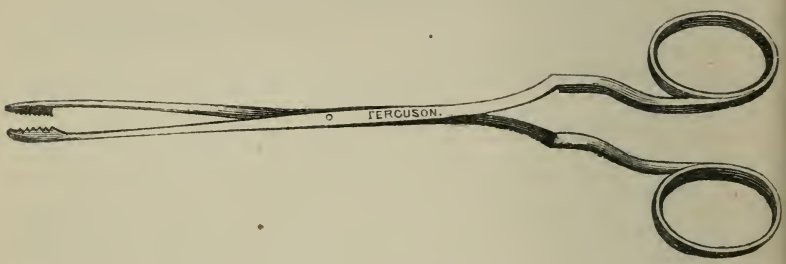
polypi, is represented in the preceding sketch (fig. 100). Specimens were exhibited by Mayer and Meltzer, by Weiss, Maw, and other makers.

M. Mette, of Stockholm, exhibited a Four-bladed Vulsellum for fixing the os or cervix uteri. The hooks were continuous with the body of the instrument, and were controllable by a movable spring.

A Pair of Forceps for applying or removing lint in operations on the uterus were exhibited by M. Stille, of Stockholm. They were invented by Dr. Nitzel. The handles were straight and trowelled.

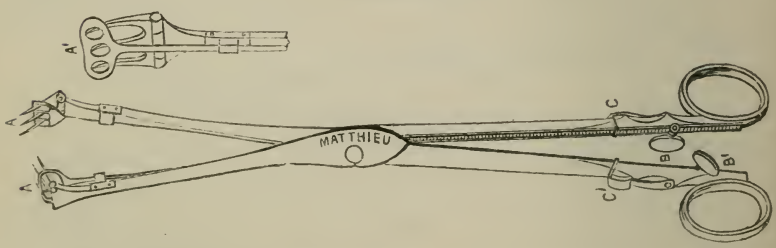
A pair of Speculum Forceps were exhibited by Ferguson, and are represented in the annexed drawing (fig. 101.)

Fig. 101.



The Pince-érigne, of Robert, was exhibited by Dr. Priestley. This instrument is represented in the annexed sketch. At its

Fig. 102.

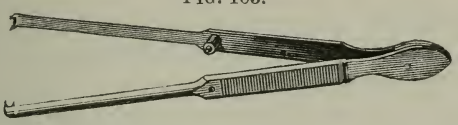


terminal extremity are three stout teeth fixed on a movable joint (A A), the whole being enclosed in a guard or sheath (A'). At C C are two clips, which fix the guard, as represented at A', and

on removing the clips and turning the screw at B B′, the stem of the guard is drawn down, and in so doing the teeth or pincers are projected at the same time that they are uncovered, until they are set at right angles to the shaft, and in this movement they are simultaneously inserted into the mass they are intended to grasp. The two blades of the forceps unlock readily at the joint, and are intended to be passed up the uterus or vagina guarded, until, being placed one on each side of the tumour, they are again locked and the teeth projected.

Mr. PRATT exhibited, among other varieties of FORCEPS, that represented in the subjoined sketch (fig. 103), which were made for Mr. Baker Brown's operation of clitorodectomy.

FIG. 103.



Messrs. WEISS showed a pair of SPECULUM FORCEPS with trowelled shanks; handles and blades crossed.

Messrs. WEISS also showed a pair of UTERINE POLYPUS FORCEPS, with cross-acting blades, and rack movements for fixing the blades in any position.

A pair of SLIDING VULSELLUM FORCEPS was exhibited by Messrs. WEISS. The instrument consisted of two blades which could be introduced separately and were fixed by a shifting joint, so that each blade could be brought to act at unequal depths in the uterus or vagina, traction being possible in an oblique or any other direction. The blades were secured in any position by means of a sliding bolt.

FORCEPS SCIE (vide Decapitators).

FŒTUS EXTRACTORS.

A case shown by LÜER, of Paris, containing—

1. A trepan for perforating.

2. A sucker to draw out the brains of the fœtus after perforation.

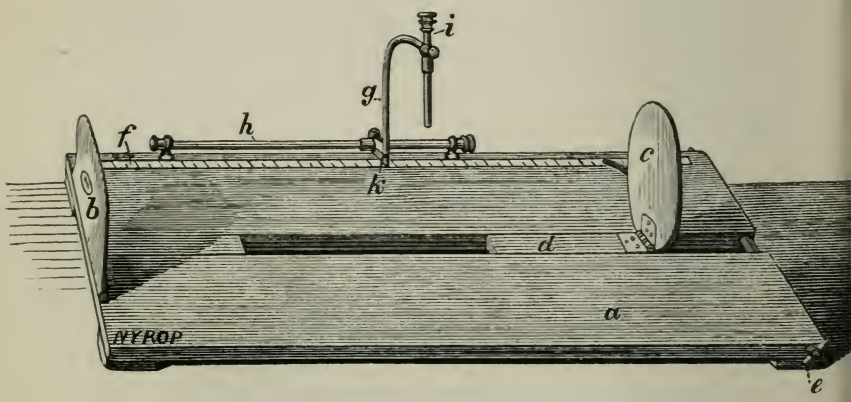
3. A sucker combined with a tire-tête, by which finally to draw down the head.

Sir James Simpson's Sucker composed of a cup of vulcanised india rubber, to the centre of which an exhausting gauge is attached. The inside of the elastic cup is soaped and carefully fitted on the scalp; the air is then exhausted and the instrument holds on firmly: traction is then employed.

FŒTUS MEASURER.

Professor Nyrop, of Copenhagen, exhibited an apparatus for Measuring the Newly Born, which is depicted in this illustration (fig. 104); B is the foot-board, and C the movable head-board, which works on pretty much the same plan as the ordinary rule used by shoemakers for measuring the length of the foot. A graduated rule is attached at the side, and an indicator on the head-board, C, marks the total length on the indicator. In like manner the taking of the length between the umbilicus and either extremity, and the dimensions of other parts, are provided for in this apparatus, which was made of polished mahogany and steel mountings.

Fig. 104.



FUNIS REPLACERS.

We may notice those of Dr. D. D. Davis, exhibited by his son, Dr. Hall Davis, of which there were two kinds. Both were composed of flat pieces of metal, straight, about 12 inches long and $\frac{3}{4}$ of an inch wide. One was uncovered, having small holes at one end for the string to pass through. The other was covered with leather without holes.

A slight modification of these was shown by Dr. Hall Davis, in which the small holes at the top were replaced by two larger, an inch below.

Sir Chas. Locock's instrument was composed of two whalebone rods—one straight throughout, the other curved for about an inch at the top. The straight one was movable, running through an eye attached to the other at the lower part of the curve; so that the funis, when included in the space within the curve, can be released readily by drawing down the straight rod and opening the ring thus formed.

Dr. Roberton's was exhibited by the inventor. It is a very simple instrument, composed of 12 inches of half-inch india-rubber tubing closed at one end. A stiffener (stillet, or uterine sound) is passed up within it to the top; when used, a tape is loosely fastened round the funis, and then the tape is tied round the end of the tube. After the funis is replaced, the stillet is withdrawn, the rest remaining behind, and being of a very soft nature, no injury can be inflicted on the uterus.

HYSTEROTOMES (see Metrotomes).

KINOMETER.

The Kinometer, invented and exhibited by Dr. Routh, was devised by him to measure the amount of uterine movement, as an aid to the diagnosis of certain morbid conditions in that organ. It consists of a speculum, closed at the vaginal end by a caoutchouc membrane; the distal end terminates in a glass tube bent at a right angle, in a part of which there is a tap. The whole is filled with coloured water; the vaginal end being pressed on, the water rises in the tube. When the instrument is introduced, the tap is opened, and then two movements are noticeable—one synchronous with the pulse, the other with respiration. It has been found, in uterine hæmatocele and cellulitis, the respiratory movement is almost entirely absent, and that in fibrous tumours both are generally obvious.

LEECHES, &c.

Various Appliances for the Application of Leeches to the Cervix or Vagina were exhibited. Of these the most ingenious was the instrument called by its inventor, M. Stille, of Stockholm, an Artificial Leech. It contained a small cutting instrument very similar to the ordinary leech-piercers; this was enclosed in a kind of section tube, which could be easily filled with blood after the punctures had been made; in fact, it resembled in principle the cupping-glass scarificator of Luer.

Mr. Ferguson exhibited his Leech Cages, one of which was composed of wire gauze, into which the leeches were to be caged. When applied to the cervix, the cage can be opened by pulling a ring at the end of the handle, and thus the leeches are enabled to lay hold of the surface to which they are opposed.

LENICEPS (see Forceps, Midwifery).

LEVER (see Vectis).

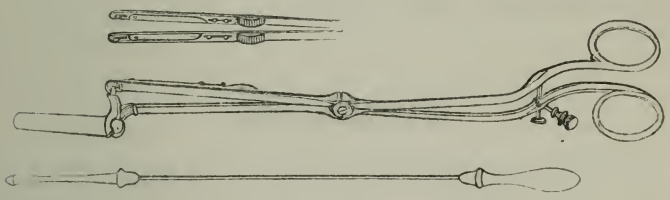
MEMBRANES, Instruments for Puncturing (see Premature Labour).

METROSCOPES (see also Specula).

Professor KRASSOVSKY'S was exhibited by Professor HUGENBERGER. The handle of the instrument is like that of a pair of scissors, and at its extremity is a trivalve speculum. The blades open by closing the handles, which are kept together by means of a screw.

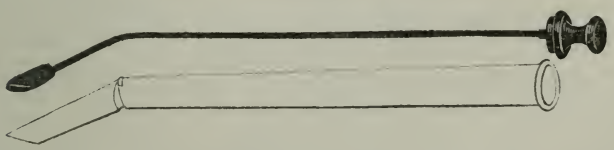
The blades are $1\frac{1}{2}$ inch long, and when closed measure at their point the $\frac{1}{8}$th of an inch; when opened, $\frac{1}{4}$ of an inch. The plug and speculum resemble in miniature Madame Boivin's speculum. The whole instrument is $9\frac{1}{2}$ inches long, and is used through any ordinary cylinder speculum. It is represented in the annexed sketch (fig.105).

FIG. 105.



The METROSCOPE of Dr. GRÜNEVALDT was exhibited by Professor HUGENBERGER.—This instrument is a modification of Desormeaux's endoscope, and consists of two metal tubes (twisted inside), coniform in shape (fig. 106). Of these two tubes the shorter passes through the longer one, which, at a distance of 2 to $2\frac{1}{2}$ inches

FIG. 106.



from its point, obliquely cut, has a joint movable to an angle of

130°; to this tube belongs a whalebone shaft or guide, terminating in a button point. The tube's angle is retained by this whalebone when the instrument is being introduced into the cervical canal. After its introduction, by turning the guide to the right, making it revolve on its own axis, it is gradually withdrawn, and the smaller straight tube is then introduced. The angle of the larger tube being movable is straightened by the introduction of the straight smaller tube, and a full view of the uterine cavity is then obtained.

Dr. Tyler Smith's Metroscope, made by Messrs. Weiss.—This instrument is applied through the speculum described further on (vide *Specula*). It consists of two parts—a mirror and a cylindrical tube, both provided with long handles. By means of a screw the mirror can be inclined to any angle, so as to receive and transmit a ray of light through the tube. The tube (which is of three sizes), after having been gradually introduced into the os uteri, is retained *in situ* by means of the pliant wire which fixes the handle. The mirror is fastened to the lower blade of the speculum at two points.

METROTOMES.

Of instruments for dividing the cervix uteri there were a great variety, the difference in their construction having reference chiefly to the desirability of having one or two blades; some authors recommending one, others two, the latter being careful to obtain simultaneous and equal division of the two sides of the cervix.

Sir James Simpson's Instrument is a kind of bistouri caché; the end of the instrument which carries the knife is about 2½ inches long, and the size of an ordinary uterine sound. The blade is kept closed by the force of a spring acting upon the handle, and is forced out by pressure approximating the two handles, the degree to which the blade is projected being regulated by a screw fixed into one of the handles. By this instrument one side only is cut first, the instrument is then reversed and the other side is similarly treated, the cutting being effected partly by the projection of the blade and partly by the

withdrawing of the instrument while the blade is thus exposed. The instrument is represented in the adjoining sketch (fig. 107).

Fig. 107.

Dr. Coglan's Metrotome consists of a central blunt or probe point less than a $\frac{1}{4}$ of an inch long, about the thickness of a No. 1 bougie, and proceeding from this are two cutting sides about $\frac{3}{8}$ths of an inch wide. The whole instrument, including the handle, is about $8\frac{1}{2}$ inches long, and is slightly curved for 3 inches from the point to correspond with the oblique position of the uterus. The advantage contended for by the author is that with this instrument, guided by the probe point, we are sure with ordinary care to have our incision right into the uterine cavity, and perfectly central, and by using instruments of different widths we can have our incision of the exact extent it is required. For the purpose of keeping the incised part open the author employs a piece of sheet lead rolled out so thin as to be very light and flexible, but sufficiently thick to retain its shape, about 1 inch long and $\frac{3}{4}$ of an inch wide; this is rolled up into the form of a tube, the edges of the ends being slightly turned out into a lip.

Dr. Greenhalgh's Bilateral Metrotome.—This instrument is $11\frac{1}{2}$ inches in length, and ends in a blunt extremity like a uterine sound, $2\frac{1}{4}$ inches long. It consists of two lateral halves, which can be firmly clasped together; each half contains an inclined plane, regulated by an adjusting screw, upon which a blade is made to move downwards and outwards by pulling the handle of the instrument.

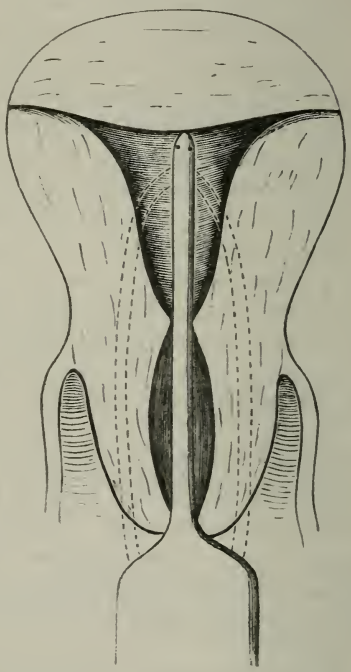
The advantages claimed by the inventor for this instrument are—1. Its extreme simplicity; it can easily be cleaned. 2. Its use requiring no exposure of the patient. 3. Its easy, safe, and painless application. 4. Its cutting from within outwards, the blades gradually diverging, thus dividing the internal os slightly, the external os freely. 5. The accuracy with which the

direction and extent of the incisions can be regulated. 6. The rapidity and certainty of its action.

The instrument is represented in the annexed sketch (fig. 108). Fig. 109 shows the instrument in action, or rather the supposed line of incision, as seen in the dotted lines.

Fig. 108.

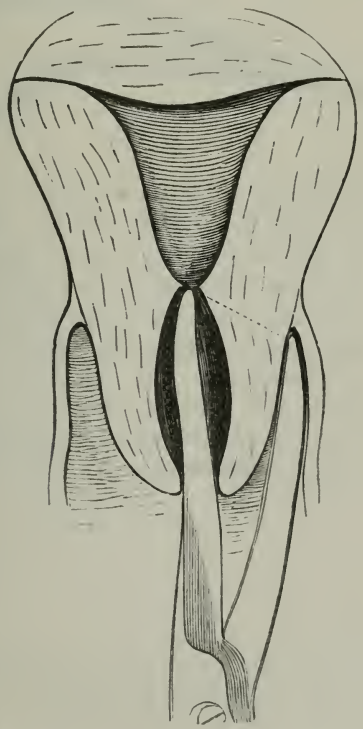
Fig. 109.



In Dr. Savage's Double-action Metrotome the divergence of the blades is produced by the action on two pins in the contrary direction of the semi-elliptic curved shanks, the extent of incision being graduated by moving the pins. The instrument can be used with one hand. The amount of divergence of the blades consequent on drawing down the shanks (by the single handle) within the sheath depends on the shape of the ellipse; the blades fall into the sheath immediately on completing the incision.

Dr. Barnes's Instrument (fig. 110) for dividing the Cervix Uteri consists of a modified pair of scissors. One blade, strong and somewhat probe-shaped, passes through the narrow os into the cervix, whilst the other blade, slightly concave on the cutting edge, so as better to seize the rounded surface of the cervix, is applied at any point of the vaginal portion the operator chooses.

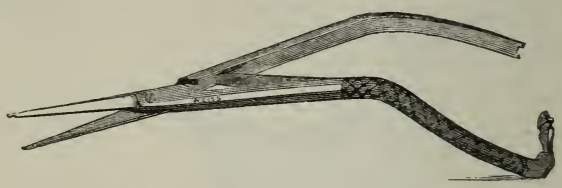
Fig. 110.



The author claims the following advantages for this instrument:—1. That by it we are sure of cutting exactly as much as we want, and no more. 2. That in cutting from without inwards instead of from within outwards we are cutting towards safety and not towards danger. 3. That it cannot cut deep into the substance of the cervix in a level with the os internum. 4. That the incision partakes of the crushing character. 5. That the instrument is most simple, inexpensive, and not likely to get out of order. 6. That the wound made by it is not less likely to reunite by first intention, as it gapes better than that made by knives.

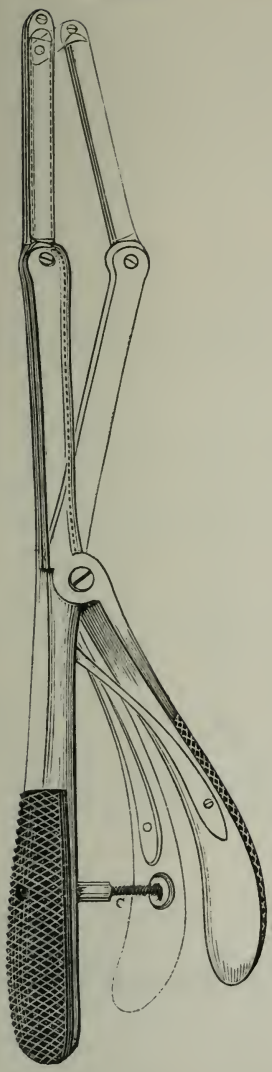
The instrument is represented in action in the above sketch (fig. 110), and the scissors are here shown (fig. 111).

Fig. 111.



Mr. Spencer Wells' instrument contains two blades, each about 2 inches long, lying one over the other, and when united are about the size of the common uterine sound. The back of one blade protects the edge of the other; they are united together at their extremity by a joint. By pushing a sort of trigger the blades open in such a way that the one moves upwards, the other downwards. The size of the incision can be precisely regulated by a movable guard. No speculum is required. The cervix is divided equally on both sides, instantaneously, safely, and without exposure to the patient.

Fig. 112.

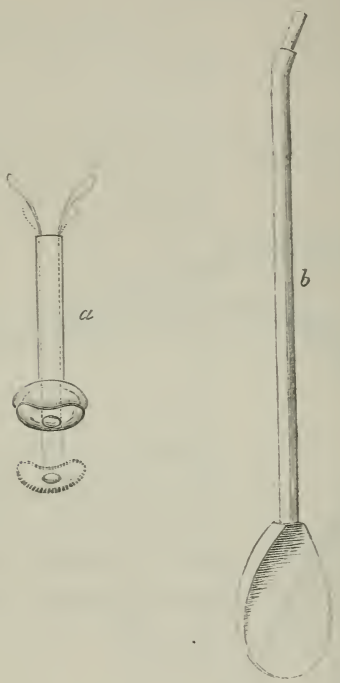


Dr. Aveling's instrument was invented in 1865. It is like Sir J. Y. Simpson's, except that the hinge of the blade is at the point instead of at the centre of the instrument. By pressing the handle an incision is made, slight at the apex and broad at the base. The inventor formerly used a double hysterotome, but discarded it, because the thinner and more yielding side of the uterus was divided by it to a greater extent than that which was thicker and firmer, and which consequently required division most. The instrument is represented in the accompanying sketch, half size (fig. 112).

After the operation of hysterotomy, as well as at other times, the author uses an intra-uterine spring tent which he originally invented in 1864, to obviate the inconvenience which was caused

by the ordinary stem slipping out. Some have experienced difficulty in withdrawing this instrument; this, however, may be easily overcome by tying a piece of thin string to the base of the inner slide. By this it may be withdrawn into the tube, and the instrument will then come out readily. These instruments are also represented below, half size (fig. 113).

Fig. 113.



In fig. A the dotted lines represent the springs withdrawn into the tube and ready for introduction. Fig. B is a stalk, the end of which fits into *a*, and is used for the purpose of introducing the latter into the uterine cavity. There is a regulating screw represented at C in the drawing of the hysterotome, upon which the handle of the instrument is pressed in cutting, as is seen in the sketch.

Dr. Marion Sims' Metrotome comprises two blades, which are, when not in use, retained in the body of the instrument;

beyond this projects a very fine probe-pointed guide, which is smaller than the common sound, and along this, by pressing one or both of the rings at the other end of the instrument, the blades slide. The instrument is so constructed that the blades may either be used singly or both together.

These points are very well represented in the accompanying sketch, where it will be seen that the blade of one side is projected, while that of the other is only shown in dotted lines (fig. 114).

Fig. 114.

Dr. Sims also exhibited the following instruments, which are employed by him in the operation for the division of the cervix uteri.

First. The small tenaculum figured in the annexed sketch

Fig. 115.

(fig. 115), which is used for pulling forwards and fixing the cervix uteri.

Secondly. The straight-bladed but angular, or the curved scissors represented below (fig. 116), by means of which the

Fig. 116.

cervix is divided, one blade of the scissors passing into the cervical canal.

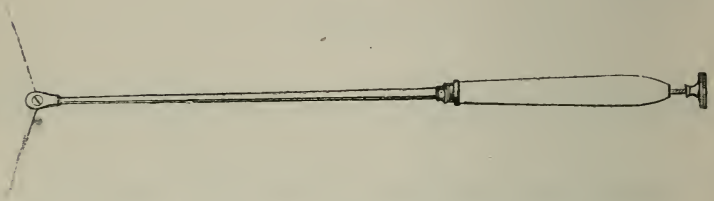
Thirdly. The part of the cervix between the cut portion and the internal os or cavity of the uterus is divided by means of the

SMALL BLUNT-POINTED KNIFE represented in the annexed sketch

FIG. 117.

(fig. 117); this is fixed in a handle and may be set to any angle by a screw at the end of the instrument, as is seen in this sketch

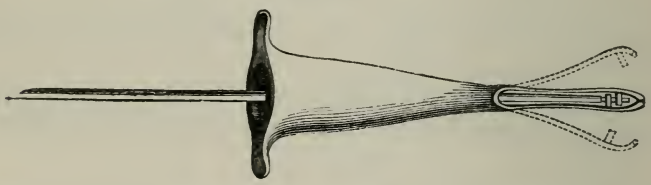
FIG. 118.



(fig. 118). If any hæmorrhage occurs, it is to be controlled by the application of a small bit of sponge in a probang saturated with some styptic solution.

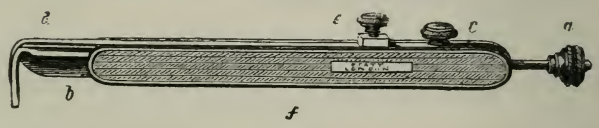
The adjoining sketch represents the INTRA-UTERINE EXPANDING STEM which is inserted into the cervix after division of that canal (fig. 119).

FIG. 119.



Mr. PHILIP HARPER'S METROTOME is represented in this sketch (fig. 120). This instrument is intended for use in cases of

FIG. 120.



labour where from any cause the os is rigid, hard, and undi-

latable. It may be applied as a scarificator when the os is inflamed, or to divide more deeply in cases of absolute partial or complete rigidity, and where rupture of the uterus is dreaded.

The body of the instrument *f* is flattened upon its sides, and of sufficient strength to be easily manipulated when the end *d* is introduced through the os. Along the upper part is a sliding rod, *c*, *d*, curved at right angles, and capable of being fixed in any desired position by the screw *e*. This rod is grooved along the under surface to allow the blade *a b* to glide easily in it. When in use the sliding blade is fixed to a length corresponding with the thickness of the os which is to be cut, and the blade *a b* being drawn back into its sheath, the instrument is passed through the os which is thus grasped between the curved point *d* and the end of the body. The blade is then pushed out by pressing upon the handle *a*, and thus cuts through the part of the os against which it is placed. If it be desired to make a deep incision, the instrument can then be used as an ordinary knife. If we wish to divide the os in another part, the blade is withdrawn into its sheath, the instrument turned round and the blade again pressed out and so on.

We have thus the power of making any number of incisions we desire, either shallow or deep, and with perfect incapability of injuring the child or doing more than we wish to the mother.

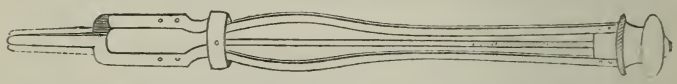
Professor Faye, of Christiana, exhibited three knives which he uses for this operation. Two of them are flexed at different angles; the other one is straight. They are slender, narrow blades, about $1\frac{1}{2}$ inches long and about $\frac{1}{8}$th of an inch wide, fixed in handles of about 6 or 8 inches in length.

Professor Lazarewitch exhibited a knife which he thus describes:—For the incision of the vaginal portion of the womb I employ a knife similar to a tenotome, the handle of which is 5 inches in length, and in which are two blades each $3\frac{1}{2}$ inches long; for about an inch at the end of the blade there is a common sharp edge, the opposite side being concave and blunt; the point of one blade is sharp, that of the other blunt and thick; and he adds, I perform the incisions not on the external surface of the neck of the womb, but introduce the point of the knife into the orifice and cut the anterior and posterior lips. From two to four such incisions may be made—the depth being 1 line, and the length from 3 to 4 lines.

The following are given by the author as the special advantages of this operation:—1. That the incisions are made in all directions with facility. 2. That more blood is discharged than by incision on the external surface of the lips. 3. The wounds are not irritated by contact with the vaginal walls from which they are protected by the uncut outer portion of the cervix.

Mr. Smith, of Christiana, exhibited through M. Mette, the instrument maker, a somewhat complicated but ingenious double-bladed hysterotome. It was so constructed that the back of one blade became the guard of the cutting edge of the other. When introduced within the cervical canal, the two blades were separated with their cutting edges towards the cervix and exactly parallel to one another, so that the incisions were effected on both sides at once, and parallel, thus cutting as deeply above as below. Moreover, as the divergence was slowly accomplished by a screw process, the incisions were also slowly made. The instrument is represented in this sketch (fig. 121).

Fig. 121.



Dr. Routh exhibited a curious old long-bladed Hysterotome, manufactured by Maddox, University Street. The mechanism is also the same as that of Sir J. Simpson's instrument, only it is double-bladed and not so wide in the middle portion. It is also bent superiorly at the end like the curve of Simpson's sound. It may be used in the same cases where Simpson's is inadmissible, and in cases of fibroids where the uterine cavity is much prolonged, or where the fibroid is in the upper portion, and where it is wished to injure the growth so as to promote its absorption.

Dr. Routh also showed his double short-bladed Hysterotome, manufactured by Coxeter, which is represented in the subjoined illustration (fig. 122). The blades are protruded by

Fig. 122.

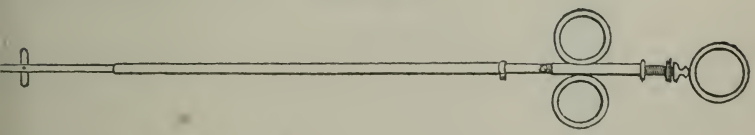
drawing down the handle as is here represented, and so far it and Dr. Greenhalgh's instrument resemble one another, but it appears to be somewhat simpler in construction, and can easily be taken to pieces. The line of incision made by both instruments is about the same.

FIG. 123.

Dr. ROUTH'S METROTOME, exhibited by Messrs. MAW and SON, and here represented (fig. 123), acts upon the principle of Sir James Simpson's instrument, but with this difference, that it is double-bladed, the two blades being projected simultaneously by pressing on the spring at the handle. The blades diverge at their extremities, and are united at their proximal ends.

M. STILLE, of Stockholm, sent a METROTOME, of which the accompanying sketch is an illustration (fig. 124). The cutting is performed by the two little blades which, by pressing on the handle at the end of the instrument, are projected at right

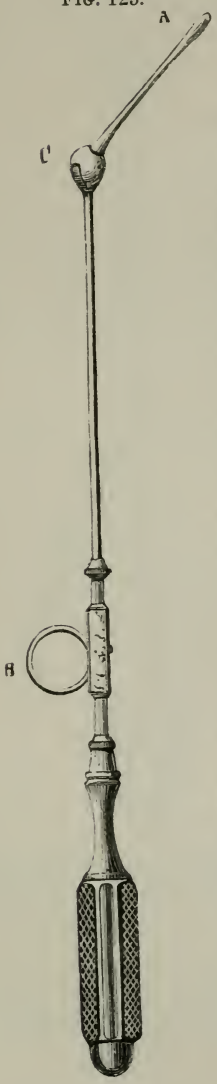
FIG. 124.



angles to the shaft, as is seen in the drawing. The handle referred to works up and down within the prescribed limits by a spring.

MISCELLANEOUS.

Fig. 125.



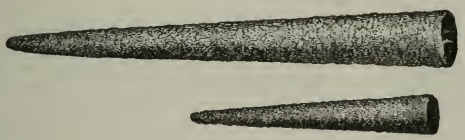
The annexed sketch (fig. 125) represents Dr. Marion Sims' Uterine Elevator, with the uterine stem, A, set at an angle of 45°, being the proper angle for an ordinary retroversion. C is the ball or disk for the support of the weight of the uterus. It revolves on its own axis in a line with the shaft, permitting the stem A to describe a whole circle except 90°—45° on each side of the shaft. This ball is perforated with seven holes (the stem occupying the eighth) made in a line around its centre, for the reception of a pointed rod, concealed in the tubular shaft, which is pulled down by the ring B, and flies back again when we let the ring go, so that the movements of the uterine stem A can be promptly arrested at any desired point in its elevation, simply by letting go the ring B, which, with the rod, is driven up by a hidden spiral spring in the handle below. The little perforations in the ball are placed intentionally at the proper distances to mark off angles of 45° in the revolutions of the stem.

Dr. Marion Sims' Uterine Depressor is an instrument used for bringing the os tincæ into view in vaginal examinations, by drawing the neck forwards by pressure in the anterior *cul-de-sac*. It is represented in the subjoined illustration (fig. 126.)

Fig. 126.

The accompanying drawings represent Dr. Marion Sims' Sponge Tents, which are made by Messrs. Mayer and Meltzer. They are here seen of the natural size, and by a peculiarity

Fig. 127.



in their manufacture, they are much smaller in the dry state than those ordinarily in use, though, at the same time, their dilating power is quite as great. They are therefore easier of application, and more efficacious than those commonly employed.

The annexed drawing represents Dr. Marion Sims' Sponge Probang, used for wiping bleeding surfaces in vaginal operations. It is made by Mayer and Meltzer.

Fig. 128.

Fig. 129.

Dr. Sims' Porte Tampon is here represented. It is an instrument designed for the purpose of enabling the patient to apply a cotton pessary to herself. The requisite quantity of cotton, tied in the middle with a strong thread, some eight or ten inches long, is placed in the porte tampon; the lid is then shut; the instrument is introduced like an ordinary speculum, the patient on the back; it is to be pushed firmly and forcibly backwards and downwards under the cervix to the posterior *cul-de-sac*. Then the piston is to be pushed forwards, the tampon is left in its place, and the instrument is withdrawn. The string previously attached to the cotton hangs from the vagina, and with this the tampon is removed when necessary.

Fig. 130 is another form of the same instrument.

Fig. 130.

Fig. 131.

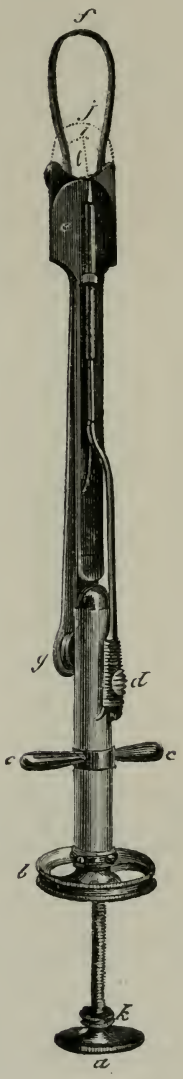


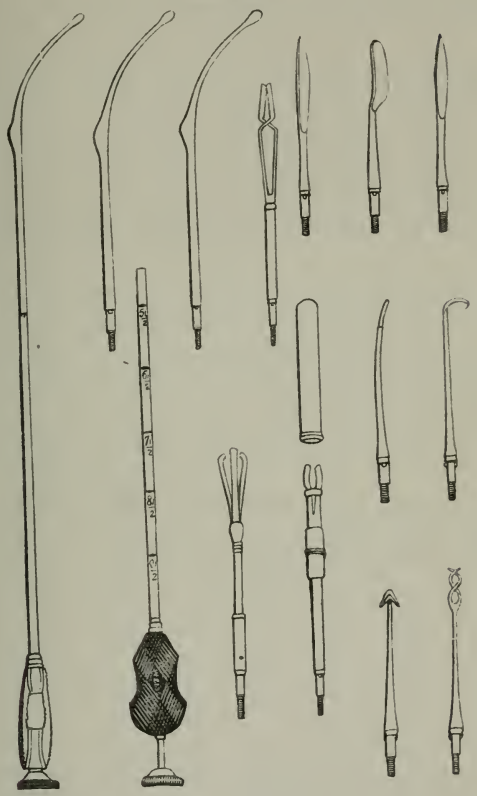
Fig. 131 represents Dr. Marion Sims' Uterine Guillotine. It consists simply of a blade added to the écraseur. In applying the instrument, let the loop *f* encircle the cervix where we wish to cut it off, turn the screw nut, *b*, till the loop embraces the part firmly and immovably, transfix the cervix with the needle by means of the slide *d*, then push the blade, *e*, quickly forwards, by forcing down the shaft, *a*, and the part will be instantly cut through. The dotted lines *l*, *i*, *j* show the relations of the loop, needle, and knife when the operation is finished.

Fig. 132.

The annexed sketch represents Dr. Marion Sims' Glass Syringe used for injecting the cavity of the uterus. It is so constructed that the exact quantity of fluid to be injected can be regulated. There is a little screw nut, *a*, which can be turned against the piston rod, upon which a screw is cut. This prevents the piston from being forced down except by the action of the screw. Half a revolution of the piston will force out half a drop, a whole revolution a whole drop, and so on.

Messrs. Weiss & Son exhibited a Portable Case of Instruments for minor operations on the uterus and vagina, of which the accompanying sketch is an illustration.

Fig. 133.



It contains three silver-ended sounds of various sizes; caustic, blue-stone, and lint holders; three knives; Marion Sims' angular hook, double-pointed hook, twisted double hook, and stem for introducing spring uterine tents.

Instruments for the "Bead" Suture. Designed by Mr. Charles Brooke, and constructed in 1840-1, were exhibited by the inventor; they comprised—

1. Lateral-longitudinal forceps.

2. Lateral-transverse forceps.

3. Universal scalpel, the blade of which can be placed in *any* direction.

4. Right and left-handed transverse spiral needles.

5. Do. do., oblique spiral needles.

6. Movable needle, for transverse vaginal fissure, or cleft palate.

7. Port-ligature. The point of the needle is brought out through the ring, and the ligature lodged in the notch of the needle.

8. Instrument for running down the knot to the bead, and then tightening it.

9. Hook for placing the second bead on the double ligature.

Mr. Cooper exhibited the British Feeding Bottle, the principal merits of which are that it is very easily cleaned. The supply of food is regulated by an electro-plated stopcock; the admission of air into the stomach is prevented; the teat is very soft enamelled india-rubber, finely perforated, to imitate the nipple, which can be instantaneously removed, washed, and wiped dry.

An Invalid's Glass for administering fluids while the patient is in a recumbent position.

Iodoform, recently introduced as a sedative.

OBSTETRIC BAGS AND CASES.

These contrivances have been designed chiefly for portability, and with the view to contain in the smallest space the appliances usually required in cases of emergency.

Barnes' Midwifery Bag, conveniently arranged with pockets and compartments, contains—Barnes' midwifery forceps, perforator, craniotomy forceps; instrument for perforating membranes; Simpson's sound for introducing uterine dilators; folding lever; blunt hook and crotchet; straight scissors; umbilical cord scissors; probe-pointed straight bistoury for incising cervix uteri; set of Barnes' uterine dilators, with mounts and stopcock; syringe for distending uterine dilators and injecting; gum elastic uterine pipe for injecting uterus; gum elastic female catheter; silver ditto; Snow's portable chloroform inhaler; 2 4-oz. capped and stoppered bottles; 4 1-oz. stoppered bottles. Exhibited by Weiss.

The Obstetric Bags exhibited by Messrs. Khrone and Sesemann were the following:

First, bag for ordinary practice, containing: — Craniotomy forceps; perforator; crotchet; long pair of midwifery forceps; 2 blunt hooks, large and small; gum elastic catheter, with strong stilette; frænum scissors; Braxton Hicks' hook; case for thread, silk, needles, &c.; syphon syringe, with long female pipe; chloroform inhaler and bottle; 4-oz. bottle; 2 1-oz. bottles; stethoscope.

Second, bag for consulting practice, containing:—Long pair of midwifery forceps; short ditto; crotchet; large and small hook; frænum scissors; Hicks' silk loop; craniotomy forceps; perforator; long pair of dressing forceps; folding uterine sound; silver female catheter; male elastic catheter, silver mounted; syphon with eleven sizes Dr. Barnes' dilating bags and long female tube; chloroform inhaler and bottle; 4-oz. bottle; 3 1-oz. bottles; 3 scalpels; sharp-pointed bistoury, curved; blunt ditto, curved; straight blunt-pointed ditto; 4 needles in handles; 2 ditto, hollow for wire sutures; silver director; spring forceps; 3 small bulldog forceps; silk, thread, needles, &c.; stethoscope; razor, shaving-brush, &c.

Both these bags may be used as ordinary travelling-bags.

Mattei's Pocket Obstetric Case contained—

The leniceps, with india-rubber coverings; a stethoscope; scissors; 2 bistouries, straight and curved; female catheter; male catheter; pelvimeter; acupuncture apparatus; 2 lancets; needles; ligatures.

Pajot's Obstetric Box, by Charrière, contained—

Laryngeal tube; one pair of Charrière's folding forceps; pair of forceps for the inferior passages; Dubois' craniotomy scissors; Blot's lever perforator; Pajot's cephalotribe; Simpson's cranioclast, with Pajot's crotchet; Pajot's blunt crotchet, with a thread of silk terminated by a leaden ball, for embryotomy; 2 Roux's needles for suture of the perinæum; 6 large serrefines for the same purpose; Dubois' membrane-piercer; Pajot's curette à délivrance of three sizes in the same handle; Dubois' long curved bistoury for enlarging (incising) neck of the uterus; pair of curved scissors for the same purpose; pointed metallic sound for piercing the membranes; Donda's ergotribe; small silver catheter for the infant; silver female catheter; long curved trocar for hydrocephalus; bottle for ergot of rye.

Rizzoli's Obstetric Case contained—

Cephalotribe; 3 pairs of long curved forceps; perforator; craniotome and tire-tête; trivella; 2 pairs of foot forceps; ovum forceps; embryotomy knife (guarded); pelvimeter.

Contents of Mr. Roberton's Midwifery Case:

Roberton's midwifery forceps; spear-pointed perforator; Roberton's craniotomy forceps; eviscerating knife; blunt hook; uterine trocar; fœtal respiratory tube; elastic tube and stilette; female gum catheter.

OPERATING CHAIRS OR TABLES.

Professor Nyrop's Delivery or Operating Table.

A very simple, cheap, and portable table for delivery (on the back), or for operations, was exhibited by the maker. It was invented by Dr. Honitz in 1862, and consists merely of a mahogany board or slab, the centre of which is so cut out at one end as to resemble the shape of a horse-shoe. There are two foot-rests, and two legs supporting what may be termed the ends of the horse-shoe. At the back is a screw-clamp, by means of which it may be fastened either to a horizontal table or

bed, or vertically to any other support. In the same way, the legs may be lengthened or shortened at pleasure so as to heighten or lower the table.

We are informed that in Denmark and in Germany this operating table is very generally used. It is represented in the annexed sketch (fig. 134), folded up and open.

Fig. 134.

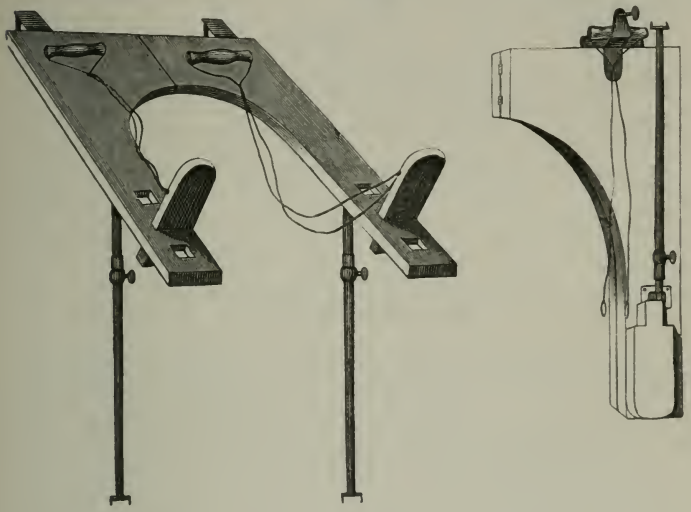
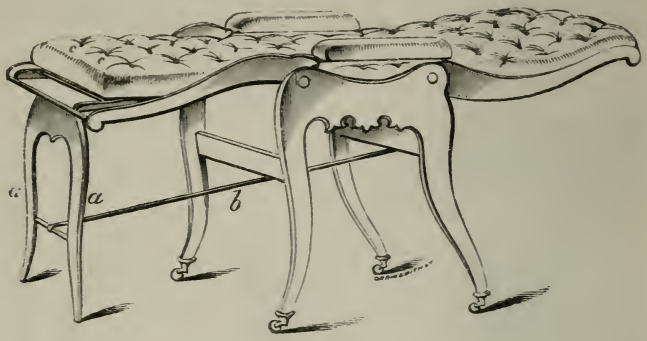


Fig. 135.

Dr. Marion Sims' Operating Chair was exhibited by Messrs. Mayer and Meltzer. It is figured in the annexed sketch (fig. 135).

It is 24 inches wide and 30 inches high, and admits of being extended into the form of an operating table, as is represented in the subjoined illustration (fig. 136).

Fig. 136.



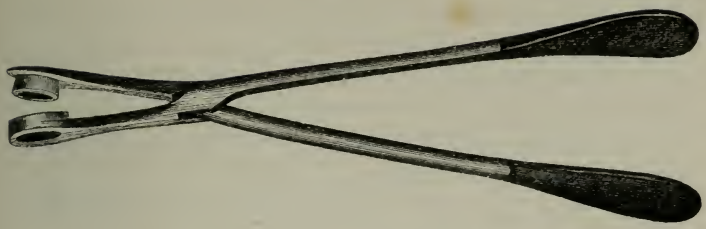
OSTEOTOMISTS.

Dr. David Davis' Osteotomist is an instrument designed to cut out pieces of the cranial bones. It is a powerful two-bladed instrument with fixed scissors-joint. A female blade is fenestrated to the shape of the segment of bone to be removed. The male blade is solid, and has an oblong projecting block or punch upon its inner surface, grooved so as to make two strong cutting edges. This cutting block is received into the fenestra of the female blade, crushing in and taking out a corresponding piece of bone.

Two specimens, one for short, one for long sections, were exhibited by Dr. Hall Davis, and are figured in Dr. D. Davis' 'Operative Midwifery,' 1825, from which these two sketches are taken (figs. 137 and 138).

Fig. 137.

Fig. 138.



Another Osteotomist of Dr. David Davis, having an oval-shaped punch, was exhibited by Dr. Radford.

Sir James Simpson's Osteotomists were exhibited by Ferguson, of Smithfield, and by Young, of Edinburgh.

These are right and left. They are two-bladed, working on a fixed scissors-joint, and having the finger-rings of scissors. One instrument is a modification of Davis's. The punch-block is, however, wider, and square instead of grooved; and the points have transverse or duck-bill teeth, so as to assist in grasping like a craniotomy-forceps.

The other Osteotome has no fenestra in the female blade, and acts more like the scissors than the punch.

Cranial Bone Forceps, Hamilton's.—This resembles, and is sometimes called in the shops, a craniotomy-forceps. It is, however, much smaller in the blades. It is constructed on the scissors principle as to lock and handles. The blades are slightly curved, and have transverse or duck-bill edges. It is designed to seize and pick off pieces of the cranial bones after perforation. It is too feeble to screw for extraction of the head. They were exhibited by Dr. Fleetwood Churchill, Honorary Fellow of the Society.

Boer's Forceps, which resemble Hamilton's, were exhibited by M. Stille, of Stockholm.

OVARIOTOMY, Instruments for.

A Case of Ovariotomy Instruments, including also those for operation for vesico-vaginal fistula, ruptured perinæum, and removal of polypi, was made for Mr. Baker Brown by Pratt, and was exhibited by Pratt.

The box was of polished Coromandel wood, lined with silk velvet. The size is about 15 inches long, 10 wide, and 3½ deep.

It contains in the lid—2 pairs of vulsellum forceps; 2 pairs of Bozeman's peculiar curved scissors for vesico-vaginal fistula, made to cut right and left; 1 pair of long, straight, sharp-pointed scissors; 1 pair of fine-pointed angle scissors; 1 pair of long-handled, curved-bladed scissors, used in paring the inner edge in ruptured perinæum; 1 pair of elbow scissors, used in ovariotomy; also a broad director, and a silver female catheter.

In the body of the case are two trays to lift out. The first contains 12 tubular needles for silver wire, of different curves, each numbered from 1 to 12. They are a modification of Mr. Startin's original tubular needle for wire sutures, but made of tempered steel; the original ones were soft for the purpose of being bent to any curve, but Mr. Brown found in practice it was better to have them firm and strong, as in some cases it requires considerable force to get the needle through. These needles have ivory-chequered handles.

In the next tray there were 4 long-handled knives, with the blades bent to an angle of 15 degrees, and made to cut right and left for vesico-vaginal fistula; 2 similar knives, but straight. These have plain ivory handles. A long-bladed knife, which Mr. Brown calls his ruptured perinæum knife, though he does not claim any invention in the matter; a long, thin, narrow-bladed bistoury, with a button-point, used principally in dividing fissures of the rectum, and an ordinary broad-bladed scalpel; a curved probe for discovering small fistulous openings, and a hook something like an inverted fish-hook; a blunt hook and a small tenaculum hook, for catching the inner edges of minute vesico-vaginal openings and bringing them down for paring.

Fitted in to the bottom part of the case were, first—2 pairs of spring forceps—"long finger forceps," used for the purpose of twisting the wire where the fingers of the operator cannot well reach, especially where the fistula is high up and it becomes necessary to pass the wire through or close to the lip of the os uteri; also 4 pairs of spring forceps with different points, such as dissecting and tenaculum, fine and broad; a pair of artery forceps; also a pair of spring vulsellum forceps, used principally for seizing small tumours or removal of the clitoris. A needle-holder, with slide, the head of which is cut inside so as

to be able to fix a curved needle in almost any angle, and without which it would be almost impossible to pass the wire in some of the more difficult cases of vesico-vaginal fistula ; 4 curved suture needles—1 for superficial sutures in ovariotomy, 1 for ditto in ruptured perinæum, and 2 for the deep quill sutures. Also in the same compartment a large ovarian trocar ; Bozeman's or Sims' speculum, and a vaginal retractor. A box cut out for small needles, extra wire, twine, quills, &c. On the lid of this box is let in a clamp of the original form used by Mr. B. Brown, and invented by Mr. Philip Harper. This is still used where the actual cautery is inadmissible.

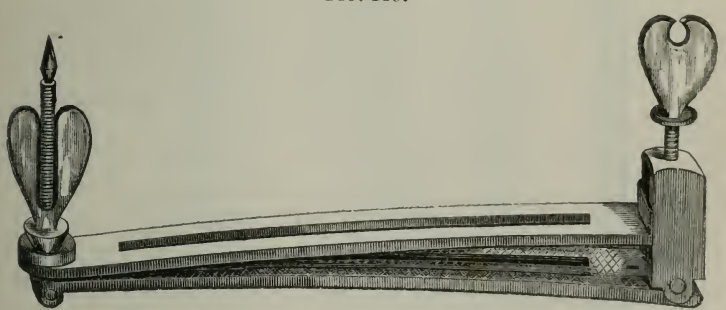
These, with two ivory reels containing silver wire and twine, complete the furniture of this portable surgical cabinet.

The following instruments employed in Ovariotomy were exhibited :

I. Clamps.

Hutchinson's Clamp, exhibited by Ferguson, is here represented (fig. 139).

Fig. 139.



Mathieu's Clamp was exhibited by Lüer. (See his Catalogue, with drawing, p. 63.)

It has the curved portion of steel affixed to one of its blades, whereby the pedicle is prevented from slipping towards the handles.

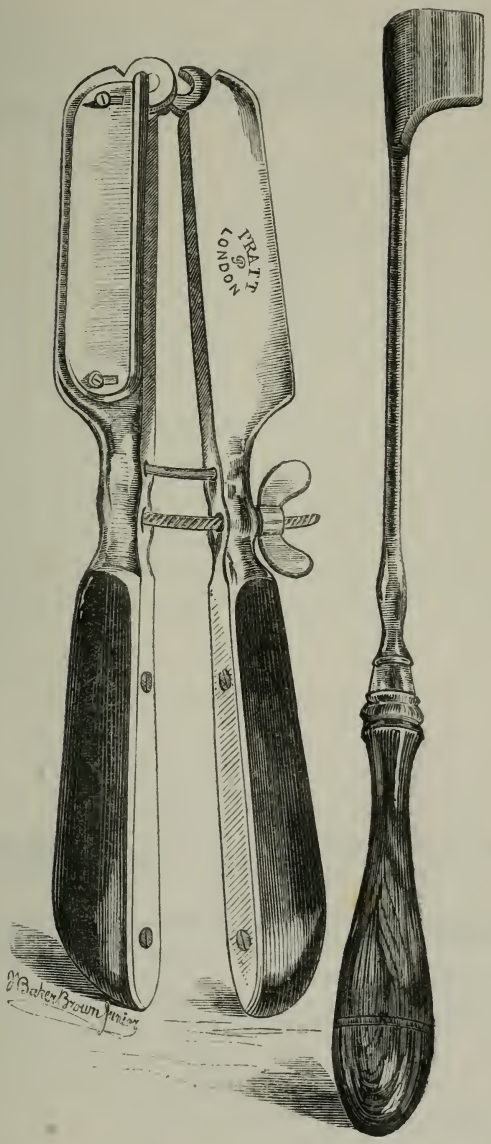
Fig. 140.

Dr. Aveling's Coil-Clamp, for securing ovarian pedicles, invented in 1865, 'Obstet. Trans.,' 1865, was exhibited by the author.

After the ligature of twine has been passed round the pedicle, the two ends are drawn through the coil by a loop of wire. They are then drawn tight and made fast around the cross-bar. They may be unfastened, the coil withdrawn, and the ligature removed by drawing at one end at the wish of the operator (fig. 140).

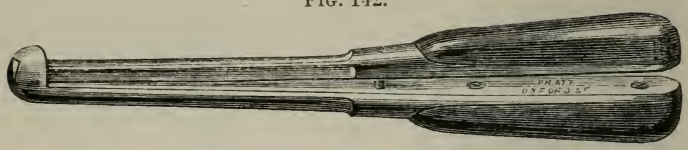
Mr. Baker Brown's Cautery Clamp and Iron were exhibited by Pratt, and are here represented (fig. 141).

Fig. 141.



Dr. Clay's (Birmingham) was exhibited by Pratt, and is here seen (fig. 142).

Fig. 142.



Dr. Krassovky's was exhibited by Professor Hugenberger.

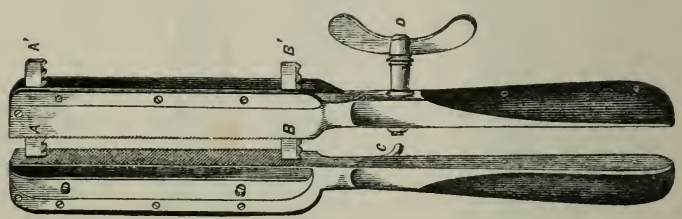
It consists of a screw-chain écraseur, having a separable head, with a small screw through the eye to fix the chain when the head is separated. The eye is expanded on each side about $1\frac{1}{4}$ inch, to prevent its being drawn into the wound. The side intended to be in contact with the skin is faced with ivory. (For a drawing of this instrument see Ecraseurs, page 71.)

Dr. Krassovsky's was exhibited by Professor Hugenberger.

This was a screw-écraseur form of handle, having an expanded head, considerably curved, with a tubular perforation on each side of the head at the point of curvature, through which a loop of wire passed over two small friction-wheels to the moving arms of the shaft. When the wire was tightened, it pressed against the flattened end of the head. The inner side of the curved head was plated with ivory, and covered with white metal, against which the stump was cauterized.

Mr. Chambers showed his Actual Cautery Parallel Clamp, which the accompanying woodcut (fig. 143) depicts. This clamp

Fig. 143.



is said by its author to possess the following advantages over those now in use:

1st. The great simplicity of its construction, and the perfect ease with which it can be applied or removed.

2nd. The clamps now in use, acting like a pair of scissors, press unequally on the pedicle while the blades are being brought together; whereas, in this instrument, the blades being perfectly parallel, the pressure is applied along the whole length of the blades at the same time, and with the greatest accuracy and nicety.

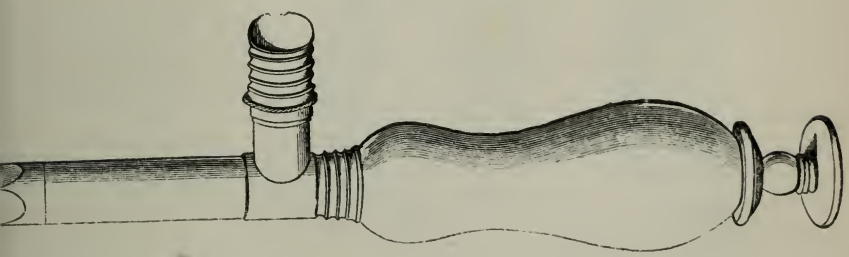
3rd. Being a right-lined quadrilateral figure whose opposite sides are parallel and equal, this clamp can receive and completely compress a larger pedicle than any other clamp yet made. It has been used by Mr. Holmes Coote as well as by Mr. Chambers, and was found to act admirably. In addition to its value in the treatment of ovarian pedicles, this clamp may be advantageously used in cases of omental hernia where it is found necessary to remove a portion of the omentum; also in castration, hæmorrhoids, vascular polypi, elongated cervix uteri, &c.

Mr. Chambers has applied it in a case of elongated cervix uteri for Mr. Philip Harper, who amputated with the actual cautery. The operation was quickly performed, and without the loss of a single drop of blood. The patient suffered little or no pain afterwards, and was discharged cured on the twenty-third day, having a good cervix and a most perfect os. She menstruated fifteen days after the operation. The instrument is made by Messrs. Mayer and Co., Great Portland Street, London.

II. Trocars and Canulæ.

Mr. Spencer Wells' Trocar and Canula for ovariotomy, with tube at right angles for attachment of elastic tubing, was exhibited by Ferguson, and is here shown (fig. 144).

Fig. 144.



Mr. J. Cooper Foster's Trocar and Canula for ovariotomy, having an elastic centre of canula which can be compressed by the finger and thumb during removal of trocar, was exhibited by Maw and Son, and is here shown (fig. 145).

Fig. 145.

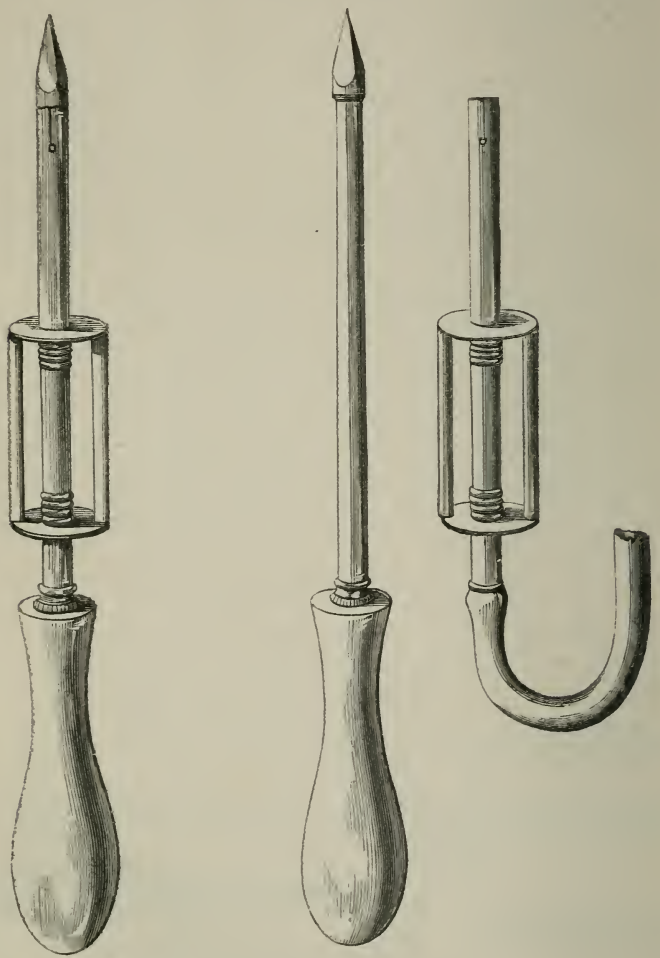
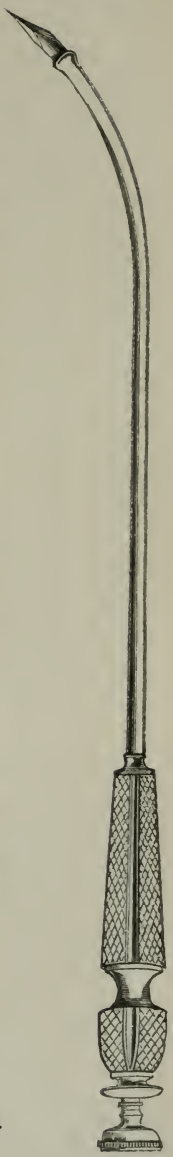


Fig. 146.



Lee's Puncturing Trocar and Canula was exhibited by Maw and Son, and is represented in this sketch (fig. 146).

Fig. 147.

Mr. Spencer Wells' Tubular Trocar and Canula in one, for ovariotomy, wherein the separate trocar is not required, was exhibited by Weiss, and is here represented (fig. 147).

Mr. Chambers' Trocar and Canula, with a *movable* claw for fixing or holding the cyst in ovariotomy. This differs from that of Spencer Wells', which has a claw on each side, but is *fixed*. It was exhibited by Mr. Pratt.

The Forceps for holding the Parietes in Ovariotomy, as used by Mr. I. B. Brown, were exhibited by Pratt, and are here shown (fig. 148).

Fig. 148.

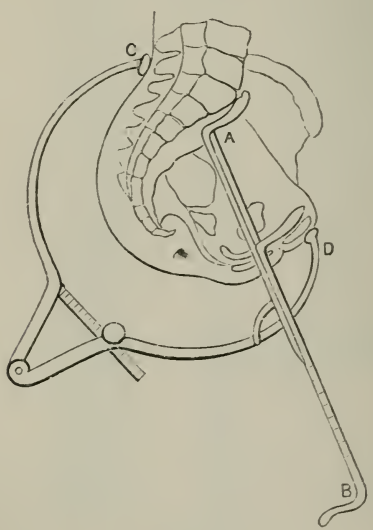
OVUM FORCEPS (vide Abortion Instruments).

PELVIMETERS.

Baudelocque's Compas d'Épaisseur was exhibited by Dr. Radford. This instrument is figured in Baudelocque's work 'L'Art des Accouchemens,' Paris, 1789, vol. i, p. 88, and is represented in the adjoining sketch (fig. 149, c d). It is in shape like a pair of callipers, and is intended for measuring the antero-posterior diameter or other diameters of the pelvis externally. To measure the antero-posterior diameter, the extremities of the arms are applied, one to the spine of the last lumbar vertebra, the other in front of the pubic symphysis, and the distance between these is read off on a scale placed between the two arms near the hinge.

The annexed drawing represents both this instrument as an external pelvimeter and the internal pelvimeter of Coutouley (fig. 149, a b).

Fig. 149.



Coutouly's Pelvimeter was exhibited by Dr. Radford. This instrument is intended to measure the antero-posterior diameter of the pelvis from within. It is figured in Baudelocque's

'L'Art des Accouchemens,' Paris, 1789, vol. i, p. 88. The instrument very much resembles the rule used by shoemakers in measuring the length of the foot, and consists of two parts, one of which slides in a groove in the other. A spoon-shaped piece projects from the extremity of each of these at right angles to it. The instrument is introduced beneath the arch of the pubes and pushed onwards until the extremity touches the sacral promontory. It is held in this position, and the pubic portion of the instrument is then slid outwards until it touches the internal surface of the pubic symphysis. The distance of the sacrum from the pubic bones is indicated by the extent to which the pubic portion is then drawn out, and which is read off in inches marked thereon. Two little handles project from the under side, and serve to hold the instrument while the internal measurement is being taken. Total length, 11¼ inches; spoon-shaped projections, 2¼ inches each in length.

The Pelvimeter of Professor E. Martin, of Berlin, is a modification of Baudelocque's instrument, and is intended for the external measurement of the pelvis. The scale has the shape of a segment of a circle, and is graduated in Paris inches. The two arms can be readily separated at the hinge by removing the screw, and the instrument is thus rendered very portable. It has been used by Professor E. Martin since 1861: see his Hand-Atlas, plate 69, fig. 1. One specimen was exhibited by M. Lütter, of Berlin, and another by Professor Nyrop, of Copenhagen.

Van Huevel's Pelvimeter was invented about the year 1845. It consists of two arms, with a compass-like joint and a scale forming a segment of a circle near the hinge. One arm is nearly straight, having a very slight curve near its distal extremity. This arm measures 11½ inches in length, and at about its middle has a projecting sort of handle of a ring shape. To this arm the scale is also immovably attached. The other arm is straight for a distance of 8½ inches from the hinge. The remaining 3½ inches is sharply curved towards the other arm. An extra length of 3 inches can be given to the second arm by an arrangement like that of a telescope slide, or it can be shortened to any required extent. Further, at the extremity of this arm there is provision for lengthening the arm in the direction at right angles to that of the arm to the extent of two inches, and here there are means for fine

adjustment by a screw. The scale moves freely through a slit in the second arm; and when the compass is in use, the scale becomes immovable at any given point by slightly moving the little lever placed over the slit through which the scale runs.

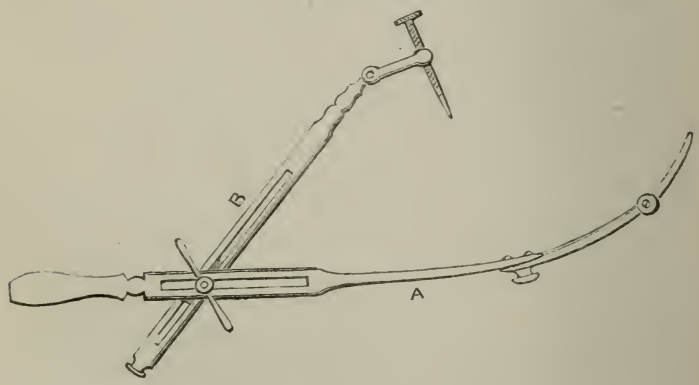
The instrument is intended for the double purpose of measuring the distance from the sacral promontory to the exterior of the pubic symphysis, and also the thickness of the pubic symphysis and soft parts covering it externally. The antero-posterior diameter of the brim of the pelvis is obtained by subtracting the second of these measurements from the first. In taking these measures, the first arm is the one which is applied internally, and its extremity is first made to touch the sacral promontory. The two arms are fixed at their proper places and retained in this position until after the instrument is withdrawn, when the distance between the arms at their extremities is measured off. During the first part of the operation the second arm is made shorter than the first, according to the angle of inclination of the pelvic brim; but in taking the thickness of the pubic symphysis the two arms should be of nearly the same length.

This instrument can be also used and applied for the external measurement alone, after Baudelocque's manner. It was exhibited by M. Lüer, Paris.

Note.—A simple—probably the first—form of this instrument is depicted in Spiegelberg's work, p. 35.

Professor Rizzoli's Pelvimeter is a modification of Van Huevel's instrument (fig. 150). It consists of two principal parts,

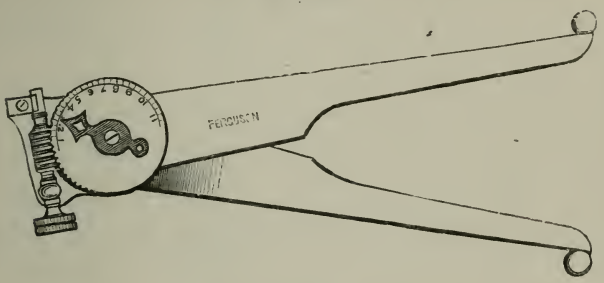
Fig. 150.



the whole forming a compass, and connected in such a manner that either arm can be lengthened or shortened at will, and so fixed by means of a screw. One arm (A) measures with its handle 18½ inches. For 14 inches, including the handle, it is straight; the remaining 4½ inches has a slight curve. The other portion (B) measures 12 inches; at its free extremity it has a screw, 3½ inches long, traversing a perforation in a direction at right angles to the arm. The instrument is adapted for measuring the pelvis according to Baudelocque's method, or for taking the measurement from the sacral promontory internally to the anterior surface of the pubic symphysis. The instrument was made by the Brothers Lollini, of Bologna.

Ferguson's Pelvimeter (fig. 151) was constructed by Mr.

Fig. 151.



Ferguson in 1850. It consists of two straight arms of equal length, each 5¾ inches long, connected by a compass-joint. A circular scale is fixed at the joint, and is traversed by the index. The arms are separated by means of a tangent screw. It is intended to be used as an internal pelvimeter. The specimen sent was made and exhibited by Mr. Ferguson, of Giltspur Street.

Dr. Murphy's is an Internal Pelvimeter. This instrument consists of two slender steel rods with slightly bulbed extremities, each 5¾ inches long and very slightly curved. These arms are introduced into the pelvis, and separated after introduction by means of two straight handles, continuations of the arms, each 7 inches in length. The arms do not cross. To one of the handles is fixed a scale which traverses a slit in the other handle, which thus registers the distance to which the arms are separated at their extremities.

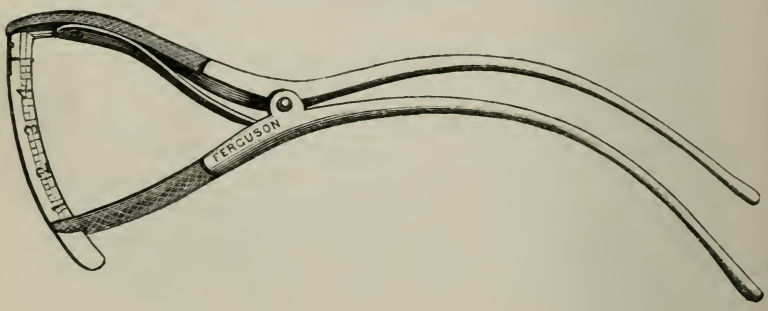
In form Dr. Harris' pelvimeter somewhat resembles it. It was exhibited by Mr. Coxeter.

Dr. Harris' Pelvimeter was constructed for Dr. Harris by Mr. Ferguson, 1858.—This is an internal pelvimeter. It consists of two arms rather sharply curved, identical in length and so placed that when not in use the one lies in the concavity of the other. Each arm measures 6½ inches in a straight line from the joint to the extremity, and 7 inches round the curve; they are composed of thin rods of steel with bulbed extremities. Two handles, each 4 inches long, are so arranged that by pressing them together the arms just described are separated. The handles are kept asunder by means of a spring. A scale graduated in inches is attached to the near end of one of the handles, and passes through a slit in the corresponding part of the other handle. The scale is provided with a sliding self-registering index, which thus marks the distance to which the distal extremities of the pelvimeter are separated when introduced.

The instrument is used as follows:—The two arms in close apposition are introduced with the concavity directed forwards until the bulbed extremity of one arm touches the sacral promontory. The handles are now approximated, and the other arm is thus brought into contact with the inner surface of the pubic symphysis. The measure is thus taken of the antero-posterior diameter of the brim of the pelvis.

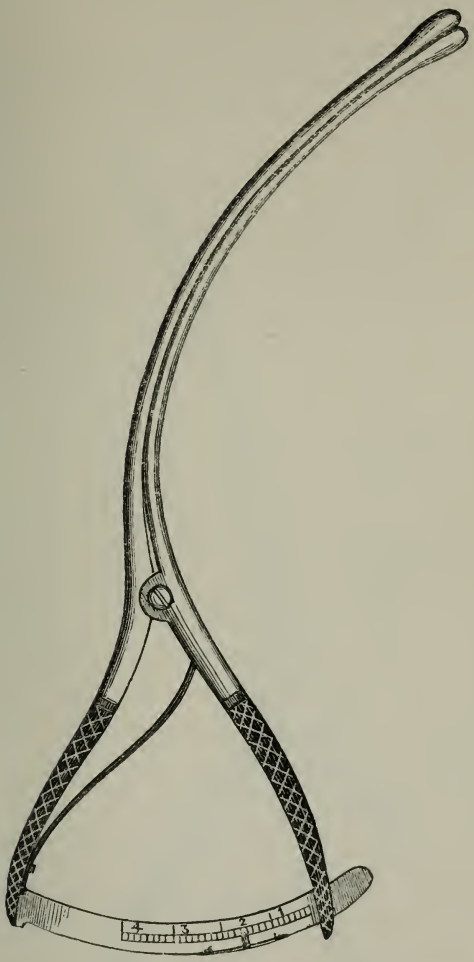
The form resembles that of Dr. Murphy's, but the curve of the blades is greater than in Dr. Murphy's instrument. It was exhibited by Mr. Ferguson, Giltspur Street, and is here represented (fig. 152).

Fig. 152.



Dr. Lumley Earle's Pelvimeter (fig. 153) was invented by Dr.

Fig. 153.



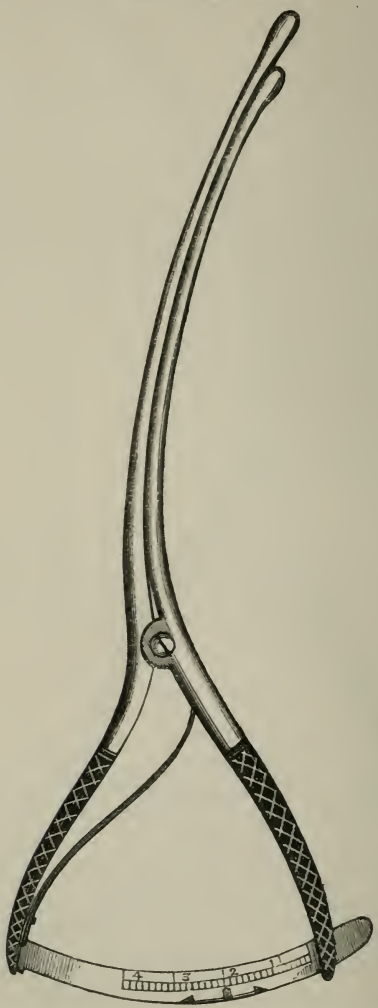
Earle in the latter part of the year 1860, and was exhibited at the meeting of the Obstetrical Society, May 1, 1861 (see 'Obstetrical Transactions' for that year). This instrument is as nearly as possible identical in form, size, and principle of action with Dr. Harris' pelvimeter above described: the one description answers perfectly for the other.

It was made by Mr. Matthews, Portugal Street, and was exhibited by Dr. Lumley Earle.

The same instrument was also made and exhibited by Mr. Coxeter.

Dr. Earle subsequently modified his instrument in the way represented in this sketch (fig. 154), the blades being much less

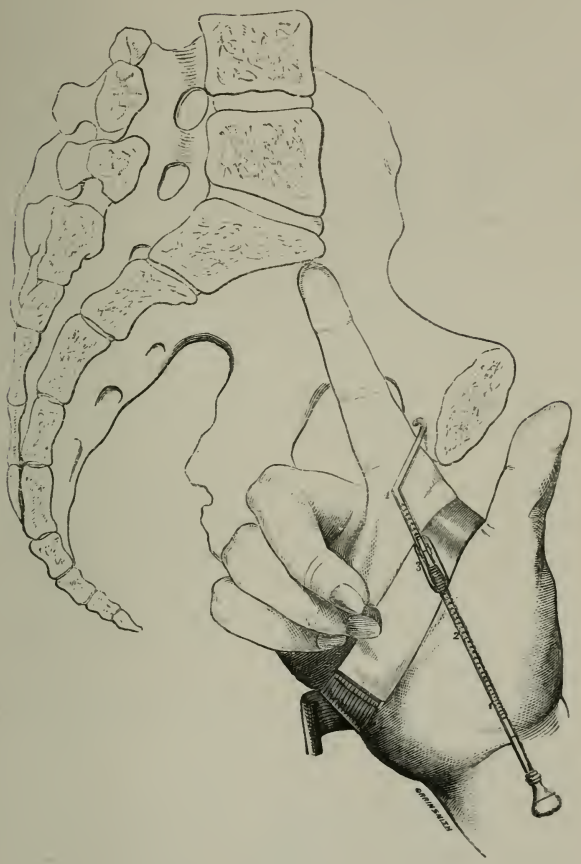
Fig. 154.



curved, and the anterior blade made shorter than the posterior.

Dr. Greenhalgh's Pelvimeter is here represented as in use (fig. 155).

Fig. 155.



It is intended for measuring internally the antero-posterior diameter of the pelvis at the brim. The principle of the instrument is to assist the finger in measuring this diameter. It consists of a band of flexible metal one inch broad, which forms a ring. This band encircles the hand, passing across the centre of the palm, the size of the ring being adapted to different sized hands by a

piece of elastic india-rubber webbing. On the surface of the band corresponding with the centre of the palm of the hand, is a projecting pivot perforated so as to allow a small metal rod to traverse it. The rod is $7\frac{3}{4}$ inches long, graduated along its central third; at its distal extremity is a small portion like a small segment of a ring at right angles to it, and adapted for sliding over the finger.

The instrument is thus used:—The hand having been armed with it, the forefinger, or the two first fingers are inserted so as to reach the sacral promontory. The curved extremity of the rod lies now on the radial side of the index finger. The promontory having been reached, the rod is drawn outwards until the ring-shaped extremity is stopped by the arch of the pubes. The distance at which the rod is thus stopped is shown on the index, and when the hand is withdrawn the antero-posterior diameter of the pelvis can be obtained by measuring the interval between the extremity of the finger and the extremity of the rod. A small spring secures the rod in one position at the will of the observer.

In another and improved form of this instrument, the palm-piece of the instrument has on its ulnar side a scale, having the shape of a segment of a circle of which the pivot before described is the centre. This enables the observer to note the angular direction of the rod at the time of the observation.

This instrument is made by Mr. Weiss, and was exhibited by Dr. Greenhalgh.

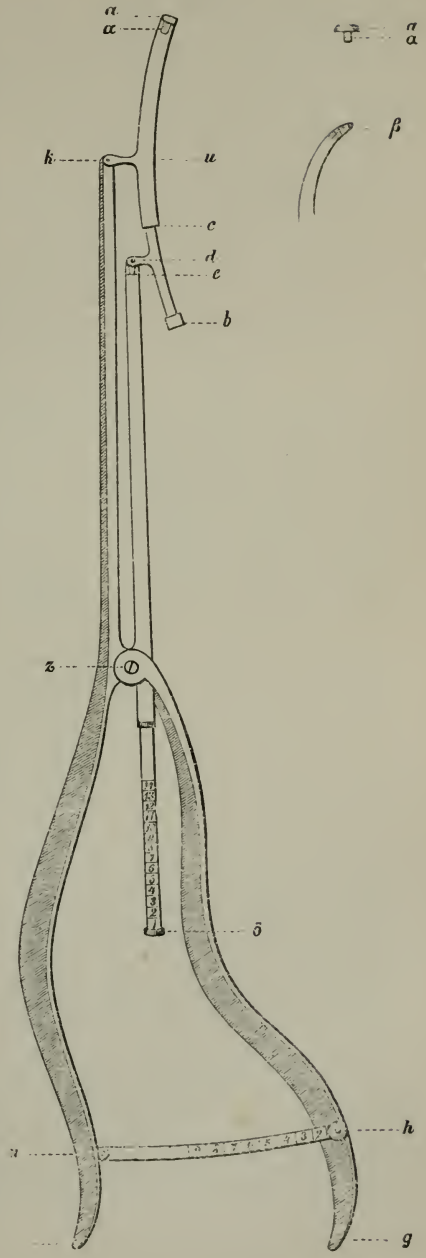
The Pelvimeter of Dr. Howitz, of Copenhagen, was invented and exhibited by him at the "Philiatrie," in Copenhagen, October 22nd, 1861.

It is an internal pelvimeter. Two arms in apposition are introduced into the vagina, and then separated by means of two handles which are continuations of the arms. The whole instrument is 12 inches long. Each of the two arms is perfectly straight. One arm is $5\frac{1}{2}$ inches long, and its length is fixed; the other arm, also $5\frac{1}{2}$ inches, can be lengthened or shortened at will to the extent of about $1\frac{1}{2}$ inches by means of a rod sliding within it. The extent of this lengthening is indicated to the observer on a scale. On another scale, fixed to the handles, is indicated the degree to which the arms are separated internally. The two distal extremities of the arms are connected

together in a peculiar manner. A rod, or rather two rods sliding after the manner of a telescope one within the other, pass from the extremity of one arm to the extremity of the other. This cross-bar is so fixed that the shortening or lengthening of the arm can readily take place. The cross-bar has a minimum length of $2\frac{7}{8}$ inches, and a maximum length of 5 inches, capable of increase, however, to 6 inches by screwing on an additional piece at one end of the cross-bar.

The instrument is used thus:—Introduced in apposition, the arms are afterwards separated, and the two extremities of the cross-bar brought into contact, one with the sacral promontory, the other within the inner surface of the pubic symphysis. The construction of the instrument allows this to be done, whatever be the angle of inclination of the pelvic brim, provided no hard substance intervene between the two points in question. To make an observation, the two scales must be simultaneously inspected, the instrument withdrawn, and then reset in the same position. The length of the cross-bar is now measured,

Fig. 156.

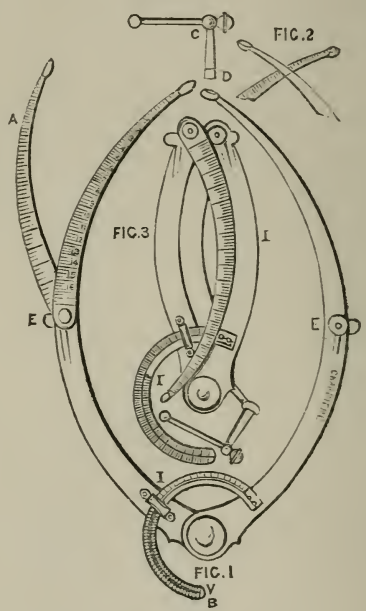


and this gives the required antero-posterior diameter or true conjugate diameter of the brim.

The instrument is adapted for taking the measurement of the pelvis also below the brim. It is represented in the preceding sketch (fig. 156), and was exhibited by Professor Nyrop, of Copenhagen.

The Pelvimeter of M. Charrière. Presented to the Académie de Médecine, January 14th, 1862, is here shown (fig. 157).

Fig. 157.



This instrument, constructed with the view of combining the qualities of several pelvimeters, is very portable, folding into a space $8\frac{1}{2}$ inches by 3.

It can be used as an external pelvimeter, after the manner of Baudelocque's.

It can be so adjusted as to take the distance from the sacral promontory internally to the anterior or external surface of the pubic symphysis, after the manner of Van Huevel's: also for internal measurement only.

The two arms are each composed of two parts so jointed that

they move readily one over the other, opening and shutting like the blades of a knife. One arm is provided with a fine adjustment screw at its extremity, copied from Van Huevel's instrument.

This instrument was exhibited by M. Charrière, Paris.

The Pelvimeter of Dr. Germann, of Leipzig, was invented by him, and was described in 'Monatschrift für Geburtsk,' Band 18, Supp. Heft for 1862.

This is a very complex and elaborately contrived instrument. It is described in a paper of great length (22 pages), and illustrated by six lithographic plates in the 'Mon. f. Geb.' above referred to. The patient is placed in a chair, to the arms of which certain parts of the apparatus have to be attached, and are thus made fixed points, the bases of internal measurement of the pelvis.

The particular object which is fulfilled in the pelvimeter of Germann is the exact determination normally of the conjugate diameter at the brim, not an exact determination of the inclination of the posterior surface of the pubic symphysis to the sacrum. The instrument consists of seven pieces—steel rods capable of being jointed in various ways, and which are portable—and of a board fixed at right angles to the body round the pelvis by a bandage.

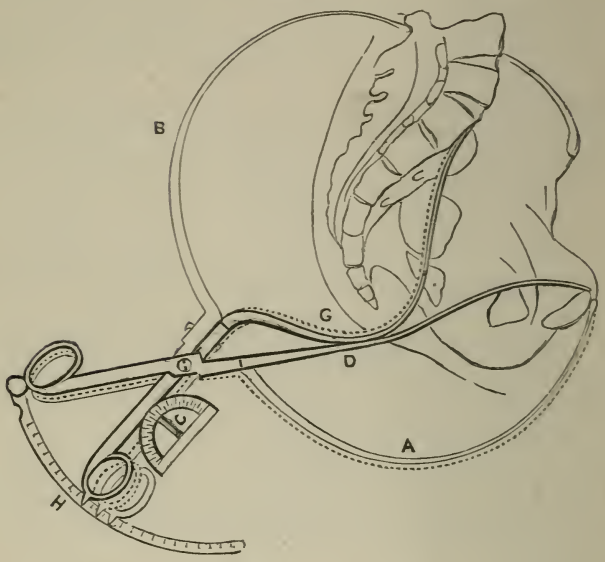
The Pelvimeter of Professor Lazarewitch, of Charkoff, Russia, was invented by him, and exhibited on this occasion for the first time. It is represented in the annexed sketch (fig. 158).

It is a universal pelvimeter, adapted for taking the external measurement, the internal measurement, or the external and internal combined measurements of the pelvis. It consists of a handle like those of a pair of scissors, measuring 8 inches in length, $4\frac{1}{2}$ as far as the pivot-joint. This handle has a curved scale (H) attached to one ring and traversing the other. The scale folds up when not in use. When used for external measurement, two arms, each a slender steel semicircular rod (A and B), are attached to the handles, and then fixed by a simple contrivance. As thus used, the instrument gives the external measurement of the pelvis in any required direction.

For internal measurement two other arms are used, C and D. The arm C has a double curve; the arm D is nearly but not quite straight. From the pivot to the extremity, each measures in a straight line $9\frac{1}{2}$ inches. The arm C is intended to be applied to

the sacral promontory, the arm D to the interior of the pubic symphysis. The arm D can be bifurcated $2\frac{3}{4}$ inches from its

FIG. 158.



extremity (at E). When the handles of the instrument are together, the arms C and D are in apposition at their extremities, and they are so introduced. In separating the handles, the blades C and D cross, and the curve of the arms is such that the projection of the perinæum is allowed for and does not interfere with the proper application of the two arms to the brim of the pubes and sacrum respectively. The internal separation of the arms is shown in the scale, and the internal antero-posterior diameter of the brim or other parts of the pelvis obtained. The arm A is graduated on its outer side for measuring the vertical height of the sacrum; also for measuring the height of the pubic symphysis.

The distance from the sacral promontory to the *external* surface of the pubic symphysis is obtainable by using simultaneously the arms C and A.

Lastly, the instrument is provided with an apparatus for determining the antero-posterior internal measurement of the pelvis at different situations; *e.g.*, at the centre of the sacrum, or at the outlet or any intermediate point. The convex border of a semi-

circular scale is attached to the handle at its side. An index suspended from a cross-bar parallel to the handle indicates on the accurately divided semicircular scale the angle of inclination to the margin of the handle, and consequently (the patient lying flat on the back) of the line which is being measured internally at the same moment. In taking observations by this method, the arms C and D are used. Within this semicircular scale F, is suspended another (G) and smaller one at right angles to it, for the purpose of determining the angular direction of any measurement made when the arms are engaged in measuring from side to side of the pelvis internally. The mechanism of this part of the instrument is of great delicacy. It can be readily detached from the handle when the pelvimeter is in use for mere ordinary purposes.

Dr. ROUTH'S PELVIMETER was exhibited by the inventor. This instrument consists of two sounds, but of unequal length: on one of these is a movable pin, which, by means of a screw, can be made to move up and down, or fixed at any point. This sound is graduated on its inner side by the ordinary inch degrees, which are marked 1, 2, 3, 4, &c. The other sound has along its middle two-thirds a slit, within which the end of the pin before alluded to may be moved to and fro. At the lower end of this is a screw, to which is attached a transverse bar, also graduated in inches and eighths of inches; but, to avoid confusion, they are marked by letters. The sounds, the upper parts of which are very pliable, being introduced in any two cavities of the pelvis, and bent in any manner required, are then locked, and the position noted and marked by the transverse bar; and when the two parts of the instrument are removed separately, and readjusted out of the body, as they were within it, the distance of the extreme ends can at once be measured. This instrument has been found to be of great advantage in the diagnosis of fibrous tumours of the uterus.

PERFORATORS.

The instruments used within the present epoch—that is, since modern obstetrics have been represented by a continuous literature—for the purpose of opening the fœtal skull in order to lessen

its bulk, were well illustrated. These instruments belong to four distinct forms or types, all of which are still adopted in different countries. These leading types are—1. The wedge-scissors, having blades cutting on the outer sides. 2. The spear-head. 3. The conical screw. 4. The trepan.

I. The Wedge-Scissors.

The earliest perforator of this form is that devised by Smellie. It is the form most generally adopted in England and in France. It was used by Naegèle, and hence acquired use in Germany. But of late years it has been greatly superseded in this last country by the trepan.

The wedge-scissors differ in the form of the perforating point, and in that of the handles.

The instrument of Smellie has the ordinary ring-handles or finger-holes of scissors; and the blades are long, having cutting edges on the outer margins, and rising in thickness to the inner margins which come in contact. They cross, in fact, like scissors. Thus, when closed, the two blades form a spear-head for perforating. After piercing the skull, the handles are forced apart, which opens the blades and extends the fissure in the skull. The ring-handles render the instrument weak, as it is difficult to push steadily or strongly upon objects affording such an uncertain grasp.

An instrument described as Smellie's was exhibited by Dubroch; another by Nyrop, of Copenhagen; another by Dr. Radford; another by Dr. S. W. J. Merriman, being the instrument used by his father, the late Dr. Merriman; another by Ferguson.

Denman's Perforator. Exhibited by Dr. Radford.

In this specimen the perforating extremity of the scissors is curved.

Another specimen of Denman's form was exhibited by Dubroch.

Another Perforator, exhibited by Dr. Radford, differs from Denman's in having the perforating extremity straight.

Dr. Lever's Perforator is one of the scissors class. The perforating ends are straight, terminating in shoulders. The thumb- and finger-rings diverge, the shanks gently curving outwards, so that on bringing the rings together the blades open.

The divergent rings also somewhat increase the grasp during perforation; but still the instrument is not a powerful one.

Holmes discarded the rings, and acquired power of widening the fissure in the skull by substituting a hinge-joint for the scissors-joint, so that the shanks do not cross. The handles diverging widely at some distance from the joint, when brought together caused the blades also to diverge.

Holmes also modified the perforating point by attaching this to one blade only, thus forming a solid spear, the opposing blade having no point, but being truncated; so that when closed the truncated blade fits under the point of the other, completing the spear. When the blades are made to diverge, both act in enlarging the fissure made by perforation.

The original instruments of Holmes were exhibited by Ferguson.

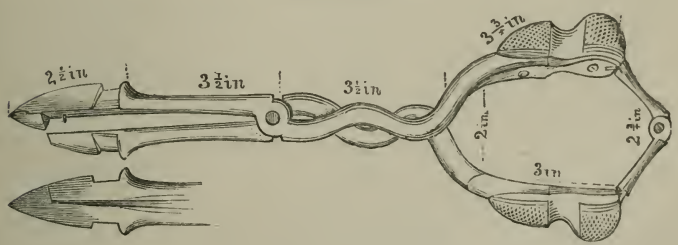
A specimen was also exhibited by Dr. Radford, and this by Weiss (fig. 159).

Fig. 159.

The modifications of Holmes' instrument are very numerous.

Dr. Greenhalgh's Perforator is a modification of Holmes'. The modification consists in adding to the point a triangular ridge on either flat surface, so as to form a double or quadrangular perforating wedge. The instrument with its several measurements is here represented (fig. 160).

Fig. 160.



In some instruments modified after Holmes and Smellie, the

divergent handles are tied at their extremities by a jointed steel band, which, when extended, keeps the blades in apposition, and, when folded at the joint, allows the handles to be brought together, and the blades to be separated.

Naegèle's Perforator has rather fine blades, cutting on the outer edge, both being pointed and furnished with stops or shoulders. The blades are slightly curved on the flat. The handles are kept apart by a simple bar, attached by a joint to one handle, so that when turned back the handles can be brought together and the blades opened. This form has given place to the one with the pointed steel bar. Specimens were exhibited by Weiss and Ferguson.

Dr. Lever's Perforator was exhibited by Durroch.

Sir James Simpson's Perforator, specimens of which were exhibited by Durroch and by Ferguson, essentially resembles Naegèle's. The blades are slightly curved. The handles are kept open by a jointed steel bar, which forms a rest for the hand whilst pushing or rotating the instrument in perforation. The joint of the bar closing outwards allows the handles to be brought together, thus opening the blades.

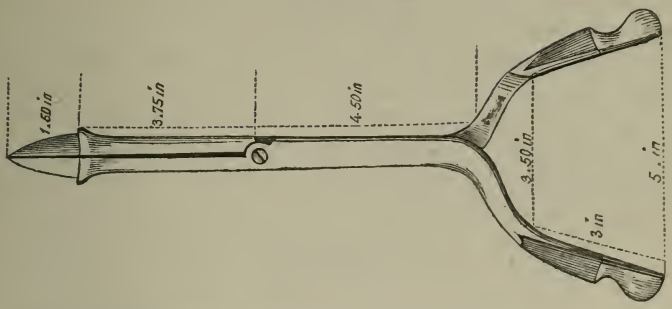
Weiss's Perforator is a two-bladed wedge scissors-point with shoulders, but differing from all the others in the mechanism employed for making the blades diverge. This consists in a screw concealed in a box which forms the stem. This mechanism resembles that used in Burton's forceps to open and close the blades.

By far the most powerful wedge-scissor Perforator is that of Dr. Oldham. The blades united form a strong spear-head. The shanks and perforating ends are in one line. The spear-head is an inch and a half long, and is divided by a shoulder from the shank. The joint is four inches and three quarters from the point of the spear-head. The shanks then run parallel for four inches and a half; then they diverge at nearly right angles, forming together a bar-rest for the hand about 3·50 inches wide, and giving with the parallel part of the shanks a very firm grasp for pushing and rotating. The handles, about 3 inches long, are set at a slightly obtuse angle so as to be nearly 5 inches apart at their extreme ends. Great power and steadiness are thus gained, both for piercing and for dilating the opening.

This instrument was exhibited by Durroch, and also in "Dr.

Barnes' Obstetric Bag," by Weiss, and is here represented (fig. 161).

Fig. 161.



Charrière exhibited a Pierce-crâne of Smellie furnished with a protecting sheath or guard, which can be removed after introduction. This modification was proposed by Dr. Chailly.

Charrière exhibited another Pierce-crâne, made for Professor Blot. It is on the wedge-scissors principle. The cutting edges are covered during introduction by the backs or blunt edges. It is described as "*à bascule et à rotation.*"

Lüer exhibited a Blot's Pierce-crâne, modified by himself.

II. The Spear-head.

This is the simplest form of Perforator or Pierce-crâne. A spear-head, more or less lozenge-shaped, is supported on a strong straight stem terminating in a handle. The point of the spear, being applied to the cranium, is pushed through it by direct pressure on the handle.

A spear-pointed Perforator forms part of the obstetric apparatus of Mr. Roberton, of Manchester. His instrument is $15\frac{1}{2}$ inches long. It would make a narrow slit-shaped opening about an inch and a half long, which might be widened and broken up somewhat by turning the handle half round when the widest part of the spear-head was in the fissure.

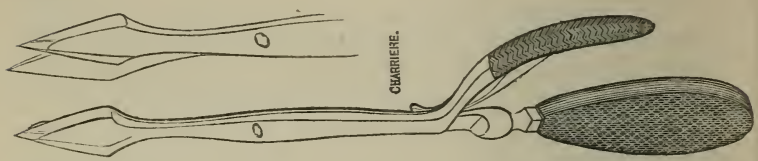
Mr. Roberton's Perforator was exhibited by Mr. Wood, of Manchester.

The late Dr. Waller, of St. Thomas's Hospital, also used a Perforator of this kind, but shorter. Exhibited by Mr. Durroch.

Another instrument of this kind forms part of the obstetric Trousse of Dr. Mattei, of Paris. Exhibited by Dr. Mattei.

Professor Blot's Pierce-crane is a modification of the spear and scissors. It consists, in fact, of a double spear; the two spears lying superposed, the back of one shields the edge of the other during introduction. The two blades form one for the purpose of piercing the cranium. When the cranium is pierced, one spear can be separated from the other by a lever-handle, thus enlarging the fissure just as the scissors does. The instrument is here represented as exhibited by Charrière (fig. 162).

Fig. 162.



III. The Conical Screw.

This form is exemplified in an old instrument, said to be French, exhibited by Ferguson. This consists in a solid screw, cone-shaped, mounted on a straight stem.

In another instrument exhibited by Ferguson, and designed by himself, the principles of the screw and wedge-scissors were combined. It is a two-bladed instrument, terminating in a screw, which forms the head of one blade. The perforation is effected by rotating the instrument, when the screw seizes and pierces. The opening is then enlarged by making the blades diverge.

IV. The Trepan-Perforator.

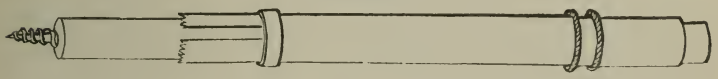
This is the form that appears to be most generally used in Germany. It is obviously designed upon the model of the trepan used in surgery for taking out pieces of the cranium in cases of fracture, &c. Such a trepan mounted on a long stem, to facilitate working in the pelvis, would represent the obstetric trepan-perforator.

Assalini seems to have been the first to adapt the trepan to obstetric practice. His instrument was described in 1810, and formed one of the collection submitted by him to the Institut National de France in that year. He thus describes it in his work—"Nuovi stromenti per estrarre un feto morbo e ribunto al disopra d'una pelvi di cattiva forma ed angusta" (Milan, 1811). In a first degree of difficulty, when the conjugate diameter was under 3 inches, he used an instrument consisting of—1st, a canula, which he applied to the head, 2nd, a trepan, having both a gimlet-perforator; and a circular trepan-saw, which, passed up through the canula, would take out a piece of bone.

This instrument was exhibited by Professor Lazzati, of Milan, Honorary Fellow of the Obstetrical Society of London.

The next Trepan-Perforator appears to have been that designed by Jörg, who thus refers to it ('Schriften zur Beforderung der Kenntniss des menschlichen Beckens, im Allgemeinen und zur Bereicherung der Geburtshülfe im Besondere, von Dr. J. C. G. Jörg, Nurnberg, 1812'): "In the preface to my 'Systematic Handbook of Midwifery,' which was published in 1807, I asked whether a head-perforator could not be constructed after the fashion of a trepan, and be provided with a sheath." . . . In the mean time Assalini brought out a perforator of this kind, which is represented in the annexed sketch (fig. 163).

Fig. 163.

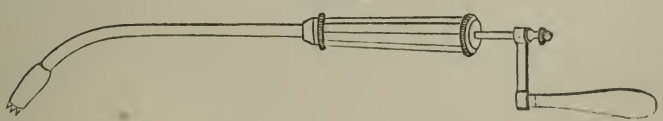


Jörg gave the first detailed description and figure of his instrument in the second part of the work first cited above, and this is repeated in an edition of his handbook published at Leipzig in 1833.

Jörg's instrument was exhibited by Dr. Helfer, of Leipzig.

Braun's Trepan-Perforator was exhibited by Lutter, of Berlin, and is represented in the annexed sketch (fig. 164).

Fig. 164.

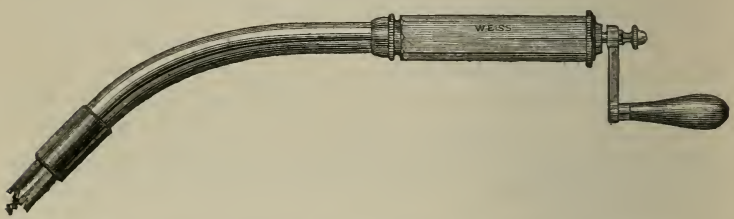


Another specimen was exhibited by Stille, of Stockholm.

This consists of a tube, much curved, carrying a powerful trepan. It is worked by a winch-handle, so that it requires two persons to manipulate. It has the advantage of being very powerful, enough so to perforate through the face without difficulty.

Messrs. Weiss and Son exhibited their modification of this instrument, which is represented in the subjoined sketch (fig. 165).

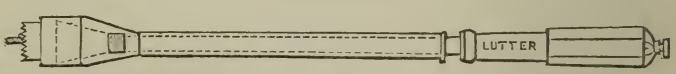
Fig. 165.



Ed. Martin's Trepan-Perforatorium, was exhibited by Lutter, of Berlin, and is represented in fig. 166.

This is an exceedingly elegant instrument, very light and manageable. It is figured in Martin's 'Hand-Atlas' (Berlin, 1862). It has been used by E. Martin since 1842. It consists of—1st. A canula, expanded at the extremity to hold the crown of the trepan, and narrowed below to the handle to receive the stem of the trepan. By this means the bulk and weight of the instrument are conveniently reduced. 2nd. Of the trepan, which has a central screw to fix the crown upon the part of the cranium to be bored, and of a circular saw. 3rd. Of a handle which receives the quadrangular end of the stem. These pieces will all separate. When introduced, the trepan-saw is sunk within the cranium. After application to the cranium the trepan is protruded and made to revolve by a backward and forward movement of the handle.

Fig. 166.

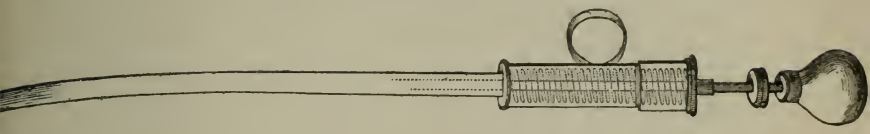


The total length is 15 inches. The diameter of the crown is $\frac{3}{4}$ of an inch.

The Perforatorium of Cederschjöld was exhibited by Stille, of Stockholm.

Professor Nyrop, of Copenhagen, exhibited his Perforator, of which the accompanying sketch is an illustration (fig. 167).

Fig. 167.



It consists of a powerful trocar guarded by a canula, slightly curved. The trocar can be protruded by pressing on the handle-end. On withdrawing pressure the trocar is drawn back within the canula or sheath by a spiral screw. This instrument has no power of expanding the opening made by puncture.

PERINÆUM, Instruments for Operations on.

Mr. Ellis exhibited his Flat Silver Ribbon and New Metallic Quills for operations on the perinæum. These were introduced by the exhibitor in 1863. They were fully described in the 'Lancet' for December 9th, 1865, with engravings illustrative of their employment. The peculiarity of the exhibitor's system is, that the flat ribbon occupies very little room, leaves no suppurating tract, holds the structures very firmly and truly, and is capable of being fixed by a most simple method. It is thus applied:

"The flat ribbon of wire being passed through (two or three are generally necessary), is secured in a very simple manner by the peculiar arrangement of the quill which I have adapted to it. (This is shown in fig. 168.) I have made this for my own use in the following manner:—A piece of stout silver wire, of the shape called 'half-round,' which may be procured at any good tool warehouse, is straightened by a few heavy blows on a flat surface, and then cut into suitable lengths with a file or metal saw. Place two pieces of equal length, say two inches, with their flat surfaces almost in contact, and then with an ordinary soldering tool run

a little fine solder for an eighth of an inch down the two ends—no further. In this way we have produced a metal quill with a fine slit running through it, but closed at the ends. The flat ribbon is passed through this slit (formed by the contact of the opposite flat surfaces of the wire), and it may then be made perfectly fast by the simple device of giving it one or two twists, thus throwing the flat surface of the ribbon transversely across the slit, and making it impossible to pull it through or get it loose. This is done, of course, on both sides, and when the three are secured we have as perfect a suture as can be imagined. For the flat ribbon produces no suppurating tract like the cord or silk, nor does it cut through the tissues like silver wire. If the ligatures be too tight, or the parts swell much, it may be eased by simply untwisting it by a turn or two, and it can be then made just as secure again; or if it be too loose, it may with the same facility be tightened. And by having a little lateral movement up and down the slit, it has a self-adjusting tendency which is certainly not without its value. The great convenience and cleanliness of this method of operating is one of its chief recommendations, and it has this advantage in addition, that there is not the same necessity for removing the deep ligatures so quickly as when they are of silk or cord."

Fig. 168.

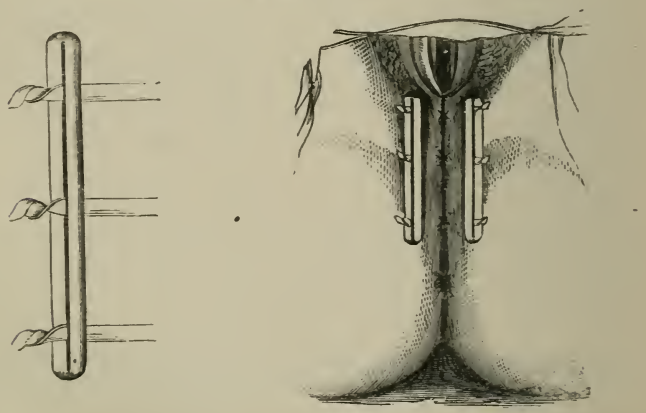


Fig. 169 represents the needle used by Mr. Ellis in these operations.

Fig. 169.

Dr. Routh exhibited his Clamp to use with wires and tubular needle in perineal operations, which are represented in the two subjoined illustrations (figs. 170, 171). It consists of 3 pieces

Fig. 170.

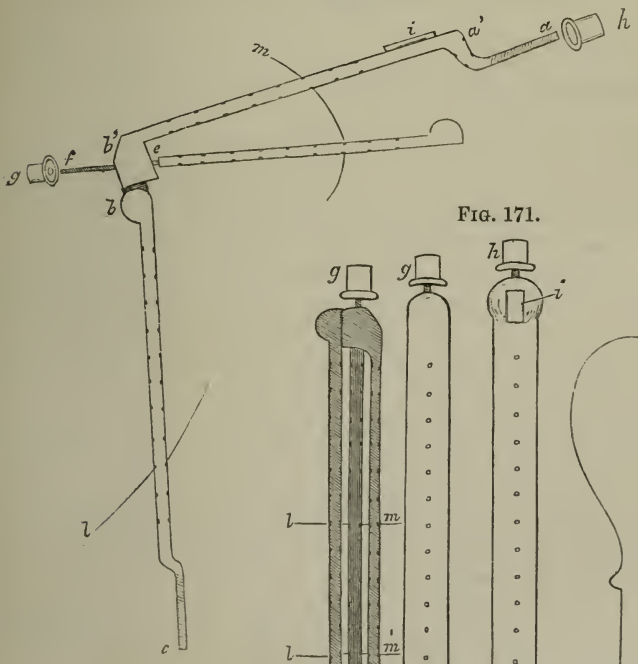
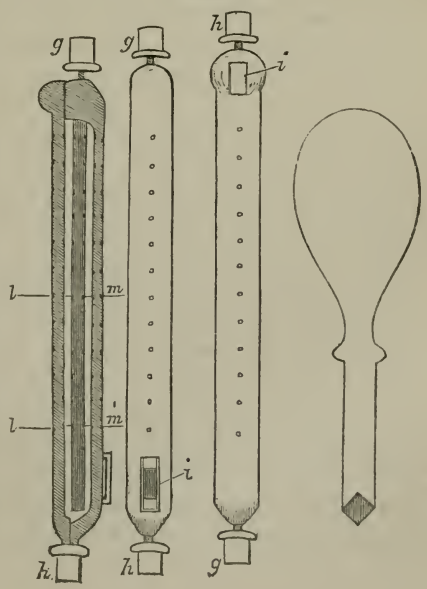


Fig. 171.



and 2 screws, besides a key to tighten the screws. Two of the pieces (*a*, *b*, and *b*, *c*), are joined together by a hinge (at *b*). The two ends of one of these pieces (*a*, *b*) have a shoulder at each end (*a*, *b*). The one at the prolonged end of the central piece, (*d*, *f*), *i. e.* by a part narrowed into a screw (*e*, *f*), is perforated, so that when the screw-cap is fixed on this prolonged end it is pulled up, and *vice versâ*. The other end of the central piece is secured by a notch at the bottom of the first piece (*i*), into which a projecting or central piece (*k*) moves. At the other end of the first two pieces another cap-screw fits and keeps them together. Both the first and second pieces are perforated by a number of holes placed in a line. It is clear when these are so placed a wire will easily go through, but when the cap-screw (at *g*) is tightened so is the wire, which is thus immovably fixed.

PESSARIES, UTERINE SUPPORTS, &c.

Pessaries and Supports of various kinds for prolapsus uteri were exhibited by different makers, English and Foreign; many of these were of such well-known form as not to require any special notice, such as air pessaries, Dr. Reid's spring pessary (Ferguson), Sir J. T. Simpson's pessary with intra-uterine stem; that of Dr. Graily Hewitt, consisting of an india-rubber ball with an intra-uterine stem for cases of retroflexion; the instrument devised by Mr. P. Mageniss which Mr. Pratt has modified by making the stem movable; the stem pessaries of Dr. F. Bird (Pratt exhibitor), made of different lengths, so that a portion projecting from the vulva, the patient on sitting down conveys additional support to the uterus, &c.

Dr. Priestley's Air-cushion Pessary for prolapsus uteri was exhibited by Coxeter, as also his Belt for anteversion, with india-rubber pad for prolapsus.

Mr. George Roper exhibited a Truss Pessary, which he thus describes:—It consists of (1) a plug; (2) an internal part, with a spring; (3) an external part, for counter-pressure.

The plug fits into the anterior vaginal pouch. On the upper edge and posterior surface of the plug is a groove, in which the anterior surface of the cervix uteri rests; the point of the cervix

is unsupported, and projects downwards into the vagina, behind the plug. The plug is mounted on a double wire, of sufficient length to support the uterus at its proper height. This wire is made of hardened metal, so as to constitute a spring, and after leaving the vagina it is turned upwards under the arch of the pubis, one portion taking a curve to the right, and the other to the left; the two are then united in front of the symphysis pubis. It thus forms a truss, the external part over the symphysis pubis being a fixed point; the internal one, by means of the spring, with the plug attached, acts on the anterior wall of the vagina. The pessary is maintained in position by means of the grasping action of the spring behind, and in front of the symphysis pubis; but it is secured by a tape attached to it, and passed round the pelvis, in case of accidental displacement. The wires are so arranged that they do not interfere with the meatus, or clitoris, on passing under the pubic arch.

The ends obtained by this pessary are stated by the author to be as follows :

(1) It supports the uterus at its proper height.

(2) It preserves the anterior wall of the vagina of natural length and curvature.

(3) It maintains the uterus in its normal position, with its long axis in the axis of the pelvic brim. This happens from the point of support being applied to the under or anterior surface of the cervix, and not to its extremity. The uterus is balanced on the plug at the junction of the cervix with the body of the uterus. If the uterus slip down behind the plug (and it is quite free to do this, as the point of the cervix is unsupported, and the vagina is here unoccupied), its progress is arrested in consequence of its attachment to the anterior wall of the vagina, which is now held in its natural position by the plug and spring.

(4) The uterus cannot become anteverted. The fundus is prevented falling forwards on the bladder by the intervention of the upper edge of the plug, and by the gravitation of the uterus behind the plug.

(5) The uterus cannot be retroverted, as the fundus is prevented falling backwards by its connection with the anterior wall of the vagina, and the cervix cannot turn forwards because the anterior section of the vagina is occupied by the pessary.

(6) It prevents cystocele, or supports it if it already exists.

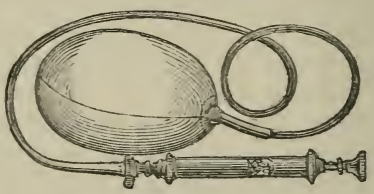
It does not distend the vagina, nor is its support obtained by counter-pressure on the soft structures within the pelvis, the point of counter-pressure being on the external surface of the symphysis pubis.

Salt's Collapsing Pessary, for prolapsus uteri and uterine hæmorrhage, is supposed by the inventor to possess the following advantages over the various kinds composed of unyielding materials:—1. The greater facility with which they can be applied. 2. Their extreme lightness. 3. Their freedom from odour after use. 4. Their being introduced collapsed, afterwards inflated, and again collapsed, for the purpose of withdrawal.

The above remarks apply more or less to all inflating pessaries, but the distinction of the invention figured below consists in the application of a small and neatly made force-pump, which gives to this pessary its peculiar value and efficiency.

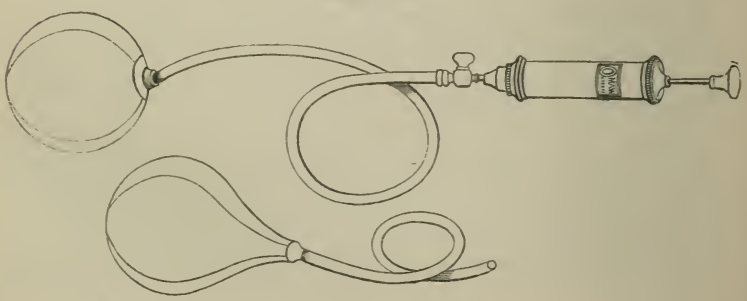
This instrument it is said has been frequently employed in cases of uterine hæmorrhage, and with success. It is represented in the annexed illustration (fig. 172).

Fig. 172.



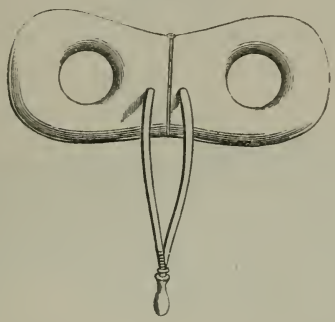
Messrs. Maw and Son also showed some Inflating Pessaries which are represented in the annexed illustration (fig. 173), the principle, that of employing air, being the same as the above.

Fig. 173.



The well-known Pessary of Zwancke for Prolapsus Uteri was exhibited by Maw and Son and many other makers, with some slight and not very important modifications. The instrument is represented in this sketch (fig. 174). The material em-

Fig. 174.

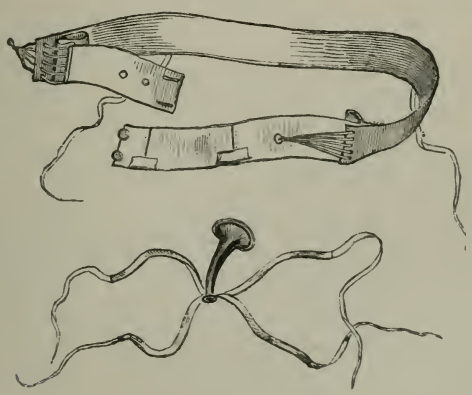


ployed varied, gutta-percha, ebonite, and boxwood being made use of.

Sir J. Y. Simpson's gutta-percha Table and Stem Pessary for Prolapsus Uteri was also exhibited.

Coxeter's Stem Pessary, represented in the annexed sketch (fig. 175), consists of a vaginal portion or stem resembling very

Fig. 175.

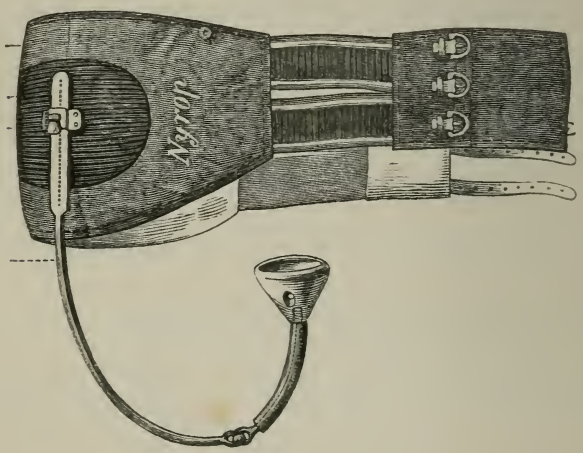


much the end of a stethoscope, capped so as to receive the cervix

uteri; from the outer end of this stem are straps which keep the instrument *in situ* by being connected with the belt which encircles the abdomen.

The Hysterophor of Nyrop (Copenhagen) consists of an abdominal belt, to which are attached straps carrying a curved metal rod, to which another rod terminating in a metallic ring is loosely articulated. This ring supports the uterus. The instrument is shown in the annexed sketch (fig. 176).

Fig. 176.

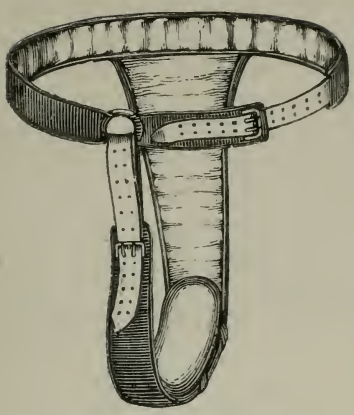


Dr. Breslau (Zurich) forwarded for exhibition his modification of Dr. Weir's Hysterophor. The abdomen is encircled by a bandage, to which are attached perineal straps of india-rubber tubing, carrying a uterine support having a saucer-shaped and perforated upper extremity.

Professor Lazarewitch, of Charkoff (Russia), exhibited his Hysterophor, the uterine support consisting of a rigid metallic rod terminating in a ring and attached to an abdominal belt.

Mr. Salt, of Birmingham, sent a good Support for Prolapsus Uteri, which is represented in this sketch (fig. 177), consisting of a soft leather band encircling the waist, and a V-shaped strap carrying a movable air-pad, the position of which can be very accurately adjusted. The strap is fastened to a loop in front, and

Fig. 177.



at each extremity the fastening consists of india-rubber rings, which yield and render the "dead pressure" less than when "persistent" pressure is requisite.

Professor Giordano, of Turin, exhibited an Elastic Spring Pessary and an Electro-Pessary, which the inventor considers to be useful in cases of "prolapsus uteri, hysteralgia, ilio-lumbar neuralgia, and similar disorders."

The Perineal Bandage devised by Dr. Gundach-Müller for Prolapsus Uteri (exhibited by Nyrop, Copenhagen) does not call for much description. The perineal bands are made of leather.

There were some curiously formed Wooden Pessaries sent from the collection of the University of Norway by Professor Faye.

A specimen of the Pessaries for Prolapsus Uteri which are given to poor patients at the Hospital in Copenhagen was exhibited by Nyrop. It consists of an abdominal belt which carries a curved metallic rod with a cup-shaped extremity to support the prolapsed uterus. It is made of rather rough material, but serviceable, probably, to those whom it is intended to benefit.

The Lever Pessaries devised by Dr. Hodge (Philadelphia) for Retroversion of the Uterus deserve special attention. Specimens of them were sent by different makers, but some obtained direct from the inventor were kindly forwarded by Dr. Churchill,

and were, perhaps, the best of the kind in the exhibition. Some of these pessaries were made by Russell (58, George Street, Portman Square), without the coating of varnish; and others (by the same maker), slightly modified in form at the advice of Dr. Routh, seem very valuable appliances.

Dr. Calthrop sent his instrument for Retroversion of the Uterus. It has an abdominal belt, perineal strap which carries an india-rubber support of a horse-shoe shape, which keeps the uterus in place by being passed behind the cervix. It is also adaptable to cases of anteversion.

Mr. Coxeter exhibited Dr. Priestley's Pessary for Retro- and Antiversion, which is represented in the subjoined sketches (figs. 178, 179).

Fig. 178.

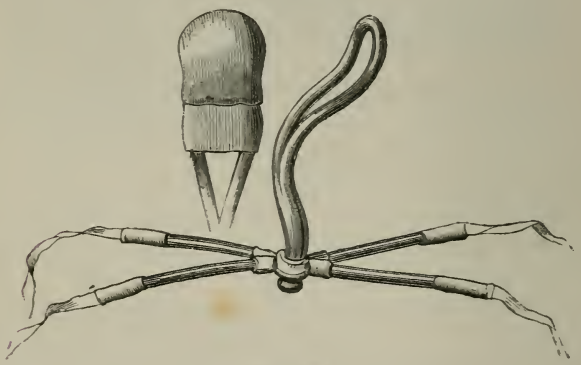
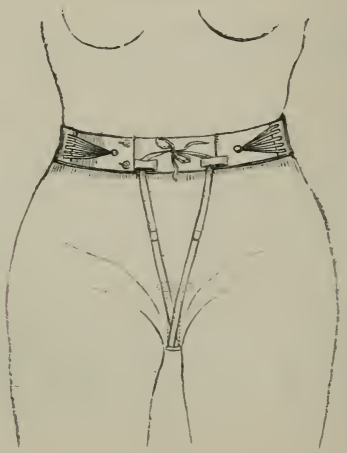


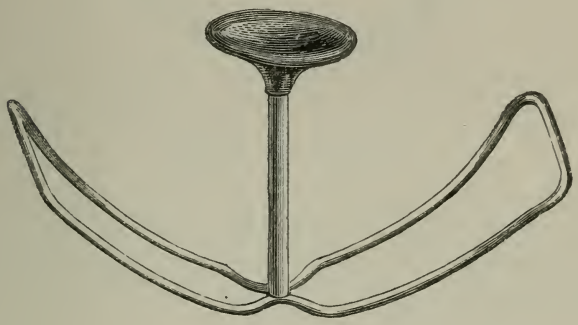
Fig. 179.



It consists of a support shaped like the blade of a pair of midwifery forceps carried on elastic perineal bands, and is either brought to bear on the anterior or posterior portion of the uterus.

Magenisse's Pessary was exhibited by Mr. Pratt, Oxford Street, and is represented in this sketch (fig. 180).

Fig. 180.

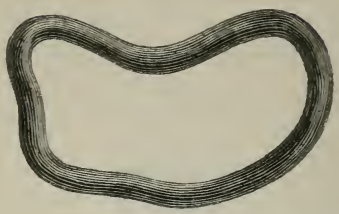


Meig's Ring Pessary was exhibited by Messrs. Mayer and Meltzer, and is represented in this illustration (fig. 181).

Fig. 181.

The same maker also sent specimens of HODGE'S PESSARY, of which the annexed is a representation (fig. 182).

FIG. 182.



PESSARIES, Medicated.

A case of MEDICATED PESSARIES was exhibited by Messrs. BELL AND Co., Oxford Street. These were made with Cacao butter as a base, of a conical shape, like a Minié ball, and weighing ʒiss each; the following is a list of them:

Iodide of lead, 5 grains.
Iodide of lead, 5 grains. Atropine, $\frac{1}{18}$ grain.
Carbonate of lime, 5 grains.
Matico, 10 grains.
Strong mercurial ointment, 10 grains.
Bromide of potassium, 8 grains.
Iodide of potassium, 8 grains.
Borax, 10 grains.
Oxide of bismuth, 10 grains.
Tannin, 10 grains.
Alum, 15 grains.
Oxide of zinc, 10 grains.
Sulphate of copper, $\frac{3}{4}$ grain.
Atropine, $\frac{1}{18}$ grain.

A case of SUPPOSITORIES was also exhibited. These were of the same shape as the pessaries, and weighed ℈j each: of these the following is a list:

Iodoform, 1 grain.
Strong mercurial ointment, 5 grains.
Extract of henbane, 5 grains.

Extract of belladonna, 1 grain.
„ „ 2 grains.
Morphia, ½ grain.
„ 1 grain.
„ 1½ grain.
Gall, 5 grains. Opium, 1 grain.
Borax, 5 grains.
Oxide of zinc, 8 grains.
Gamboge, 5 grains.
Tannin, 5 grains.

Also some Iodized Cotton prepared for Dr. Greenhalgh for internal application to the cervix uteri. It contained—1 drachm of iodine, 2 drachms of iodide of potassium, and 1 oz. of glycerine, to 1 oz. of cotton-wool dried.

Mr. W. T. Cooper, Pharmaceutical Chemist, 26, Oxford Street, W., also exhibited some Medicated Vaginal Pessaries. These were five eighths of an inch in diameter and seven eighths of an inch in length, with the bases of Cacao butter, or Cacao butter and olive oil, or Cacao butter and glycerine, as suggested by Dr. Tanner.

No. 1.—Containing—
Plumbi Iodidi, gr. 10;
Extract. Belladonnæ, gr. 3.
No. 2.—Unguent. Hydrargyri, gr. 10.
No. 3.—Plumbi Acetatis, gr. 2½;
Extract. Opii, gr. 3.
No. 4.—Zinci Oxydi, gr. 7½;
Extract. Belladonnæ, gr. 5.
No. 5.—Potassii Iodidi, gr. 5;
Extract. Conii, gr. 15.
No. 6.—Acidi Tannici, gr. 15;
Pulvis Catechu, gr. 7½.
No. 7.—Potassii Bromidi, gr. 10.
No. 8.—Iodoform, gr. 6.

Medicated Uterine Pessaries, two and three quarter inches in length and one fifth of an inch in diameter, with the bases of Cacao butter.

No. 1.—Containing—
Acidi Tannici, gr. 30.

No. 2.—Aluminis Sulphatis, gr. 10;
Zinci Sulphatis, gr. 5.
No. 3.—Unguent. Hydrargyri, gr. 25.

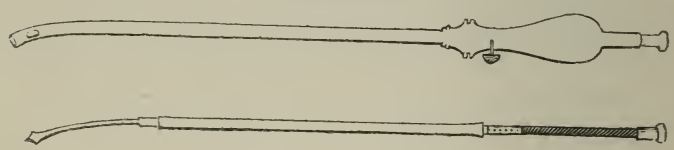
Suppositories containing—
Extract. Opii, gr. 2;
Butyr. Cacao, gr. 25.

PLACENTA, Instruments for Puncturing.

Dr. Radford showed his Long Trocar and Canula for piercing the placenta, &c.

This instrument, which is represented in the adjoining sketch (fig. 183), consists of a German silver canula, whose diameter

Fig. 183.



is $\frac{5}{16}$ths of an inch. It is 9 inches long to the wooden handle, and passing through and beyond it measures $13\frac{1}{8}$ inches. It is slightly curved towards its end, which is open. There is also an oblong oval opening on each side of the curved part; one near to the extremity, the other about $\frac{5}{8}$ths of an inch from it.

The trocar consists of a steel rod, covered by and fixed in a German silver tube to the extent of $6\frac{1}{2}$ inches; it is smooth on its outer surface to facilitate its movements. The steel rod (when uncovered) measures $3\frac{1}{2}$ inches. About $2\frac{6}{8}$ inches from the handle end of this rod there is a slit in it about $\frac{6}{8}$ths of an inch long. A wire spiral spring surrounds this portion of the rod. The other end of the rod is flat, and is slightly flexible so as to allow of its passage through the curved part of the long canula. Its extremity is polished, of the full size of the tube, and triangularly brought to a sharp point. There is a small hole in the handle to admit a small pin to be passed by the end of the spiral spring, through the part of the slit in the metallic rod most

distant from the handle. By this arrangement the sharpened end of the trocar is always safely kept by the elasticity of the spring, acting against this fixed small pin within the canula. When it is intended to protrude the trocar, pressure must be made on the button-shaped end at the handle.

When used, the point of the instrument must be carried up to the placenta, and then, pressure having been made on the button-end of the trocar, the instrument must be pushed on and through that organ, after which the small pin must be removed and the trocar withdrawn, when, in all probability, the liquor amnii will flow away.

This instrument is a modification of that of Mr. Holmes, which he recommends for the purpose of piercing the membranes in order to induce premature labour.

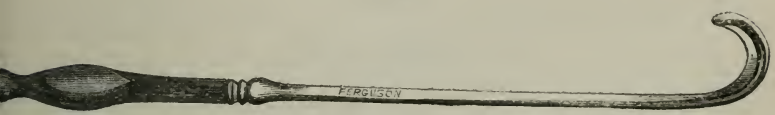
The one just described was recommended by Dr. Radford to be passed through the placenta into the amnion bag, for the purpose of gradually drawing away the liquor amnii, previously completely detaching the placenta and applying galvanism in some cases of "placenta prævia."

See 'Remarks on Galvanism in the treatment of Uterine Hæmorrhage;' also 'Lecture on the same subject,' Provincial Med. and Surg. Journal, 1844.

POLYPUS INSTRUMENTS.

Sir James Simpson's Polyptome or Polypus Knife is in the form of the usual blunt midwifery hook, with the concavity, however, of the hook not blunt, but turned to a cutting surface by the insertion of a piece of well-tempered steel. The instrument is shown in the annexed woodcut (fig. 184): length,

Fig. 184.



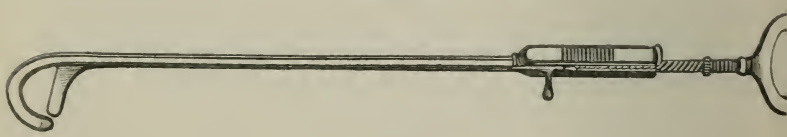
10 inches; metallic shaft, 6 inches; wooden handle, 4 inches. The cut represents the curved portion or hook at the ex-

tremity as somewhat wider and larger than the polyptome made in the first instance, and which Sir J. Simpson has since used in practice. Perhaps an increased or a diminished size and width of the curved hook might render the division by it more easy according as the stalk of the polypus is very thick or comparatively slender.

The extreme point of the instrument is blunted and rounded, and the cutting portion or blade is so protected or concealed by it and by the back wall of the curve, that it can be introduced into or withdrawn from the vagina without any chance of the edge injuring or dividing the vaginal structures themselves. To be always able to discover the direction into which its hooked extremity points after it is introduced into the vagina, the front aspect of the handle is distinguished by having a slight knob or other mark on it.

Dr. Aveling exhibited his Polyptrite. This instrument was invented in 1849, and modified in 1857 and 1863. It consists of a long hook, a slide, and a screw. In using it the hook alone is first passed over the neck of the polypus; the slide is then pushed up as far as it will go by the hand, and then, by means of the screw, the operation is completed by forcing the blunt blade of the slide into the fenestrated concavity of the hook, and through the neck of the polypus. The flat plate is to be held by the thumb and finger of the left hand to prevent the instrument from rotating. It is of great consequence that the blade of the slide should fit accurately into the opening in the hook. This instrument is figured in the annexed sketch (fig. 185).

Fig. 185.

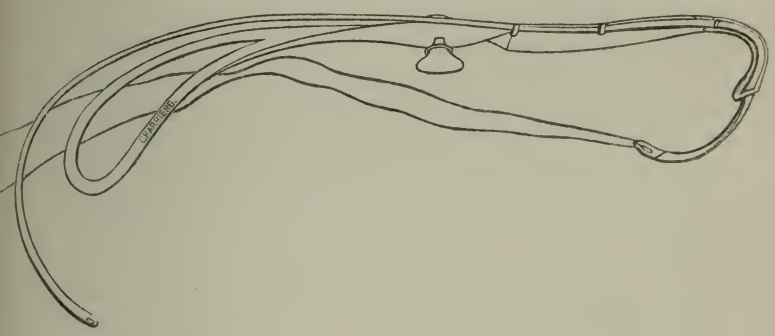


PORTE-LACS.

The Porte-Lac of Pajot, for embryotomy, was exhibited by M. Charrière, and consisted of a pair of ordinary obstetric forceps, the left branch of which was furnished with grooves in which a spring

ending in a blunt point could be made to glide. It was designed to carry a string of hemp or silk around the trunk of the fœtus in certain cases of presentation of the shoulder. The trunk could then be cut through by drawing in the ends of the cord. The construction for carrying the cord is on the principle of Belloc's sound. The instrument is represented in this sketch (fig. 186).

Fig. 186.



A Hook with a movable conductor for carrying a hempen rope round the fœtus was exhibited by Mette, of Stockholm.

Prof. Lazarewitch's Porte-Lac consists of a large, curved, round tubular hook, furnished with a flat steel band inside, which admits of being pushed up by a slide in the handle so as to protrude the point, which can then be seized and brought down. The mechanism is that of Belloc's nasal sound. It was exhibited by the Professor.

PREMATURE LABOUR (Instruments for the Induction of—for Puncturing the Membranes, &c.)

M. le Dr. Tarnier's instrument, as improved, was exhibited by M. Verrier. It consists of an elastic tube, 13 inches long, open at one extremity and closed at the other. At the closed or uterine end, the tube is very much thinner for about an inch and a half, so that, on either water or air being passed into it, this thinned portion *only* dilates, the remainder being firm enough to resist the pressure of the fluid or air from within.

It is guided into the os uteri by a whalebone stillet, 16 inches long, which is withdrawn after the tube is *in situ*. Air or water is then used to distend the thin portion of the tube, now within the os, and the open or other end of the tube is immediately tied or fastened.

Prof. Lazarewitch exhibited a novel and ingenious syringe, which he constructed especially for injecting fluid between the uterus and the membranes. This syringe consists of a glass cylinder (which is marked, so as to show the quantity of fluid used). A twisted steel rod attached to the piston works within the cylinder in such a manner (screw-like) that it is impossible for air to enter, or for the fluid to be forced forward too violently into the uterus. There are two kinds of tubes which fasten to the syringe, one of flexible metal, the other of whalebone. The metal one is marked in the way ordinary uterine sounds are, to enable the operator to know how far he has pushed it into the uterine cavity. Its extremity is smooth and *blind*, but has two oval openings on either side to allow the water to pass in a lateral instead of an upward direction. Dr. Lazarewitch generally uses four ounces of water at a temperature of 95°, and he considers this instrument safe, convenient, and efficacious.

Barnes's Uterine Dilators were exhibited by Weiss and Coxeter.

These well-known and valuable appliances are made of india-rubber in three different sizes, and are dilated with water by means of Higginson's syringe, as shown in Weiss's 'Illustrated Catalogue,' plate lii. The bags have a small thimble-like projection at their summit to receive the finger or a piece of flat wood, for the purpose of easy introduction into the os uteri. In shape the bags resemble the body of a violin; they have a long tube provided with a stopcock, which retains the fluid after its introduction.

Prof. Dubois's Pierce-membrane was exhibited by Mr. Traer. It consists of slender whalebone, with silver-mounted joint in the middle; one end is furnished with an ivory point—it is altogether about 15 inches long.

Dr. Meissner's Instrument for the Induction of Premature Labour consists of a fine trocar and canula, $\frac{1}{10}$th of an inch in diameter, 18 inches long, curved its whole length, the trocar being very sharp; it was without any regulator, and had an

obturator to assist its introduction. Invented by Dr. F. L. Meissner, Leipzig, 1796; exhibited by his son, Dr. A. Meissner.

Dr. Robert Lee's consists of a canula $\frac{1}{4}$ of an inch in diameter, slightly curved towards the end, and having a trocar adapted to it fitted with a spring in the handle for the purpose of withdrawal. The trocar has a regulator to prevent its projecting too far when in use. Exhibited by Maw and by Durroch.

Another somewhat similar was exhibited by Durroch, but without either spring or regulator.

Dr. J. Braxton Hicks's instrument is a canula $\frac{1}{6}$th of an inch in diameter, 9—10 inches long; curved moderately towards the end, which was laterally perforated by holes for the liq. amnii to flow through. It had a ring at the other end by which to hold it. A stillet, with a regulator at the handle, passed through, having a grooved trocar-point.

When in use the trocar-point was allowed to project about $\frac{1}{8}$th of an inch or less, while a lateral motion was given to it, so as not to plunge into the membranes, but to produce a rent, by which injury to the fœtus is avoided. It was exhibited by the inventor.

SCARIFIERS.

The principal novelty in this department was probably the instrument exhibited by M. Lüer, of Paris, which in addition to its scarifying blades had also a cupping-glass in the shape of a speculum attached, so that after scarification blood could be extracted from the cervix by cupping, just as is done in the ordinary cupping apparatus on other parts of the body.

Dr. Routh's Uterine Scarificator, made by Coxeter, consists of 3 parts. A German silver tube, dilated at its upper end, half the upper portion of which slides upon the lower in telescopic fashion. In the lower part of the upper portion are two grooves, one about six times as long as the other, which enables the one portion to be lengthened when the instrument is set, a pin being fixed in the smaller one, or shortened, when the pin is made to slide above the longer groove. By this means the lancets may be cleaned.

In the centre of this tube two lancets, fixed on a shoulder, which in its turn is fixed to a long cylinder, are placed. It plays uniformly on a wire-coiled spring placed in the lower portion of the German silver tube. Its extreme end is screwed on a dilated piece, which is kept *in situ* by the cap which is screwed in its turn to the end of the German silver tube. By means of the circular screw-piece which moves up or down according as it is screwed up or down, the depths to which the lancet may penetrate or scarify the os uteri is regulated.

SCISSORS.

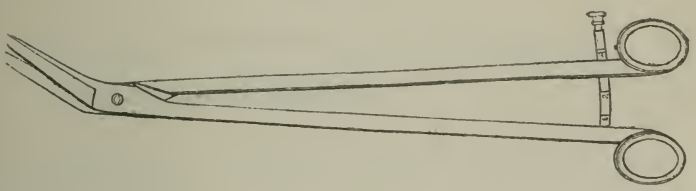
A great variety of scissors were exhibited by various British and continental makers; there were straight, curved, and angular, the curves and angles varying both in degree and direction, and involving either the blades alone, or including a part or the whole of the handles also. These variations had reference of

course to the purpose for which they were made, whether to remove morbid growths entire, or portions only of such growths for microscopic or other examinations, or for dividing the cervix in the non-pregnant or parturient conditions, or for the amputation of that part, or for operations higher up in the cavity of the uterus.

M. Stille, of Stockholm, exhibited an admirable pair of scissors, the handles being about 8 or 9 inches long. The blades about 2 inches, and the entire instrument being curved almost into a semicircle. It seemed well adapted for manipulations within the uterus.

Professor Hugenberger exhibited a modification of Scanzoni's Scissors, the improvement being suggested by Professor Krassovsky. They are represented in the annexed sketch (fig. 187). It will be seen that the blades are set on at an angle, and

Fig. 187.



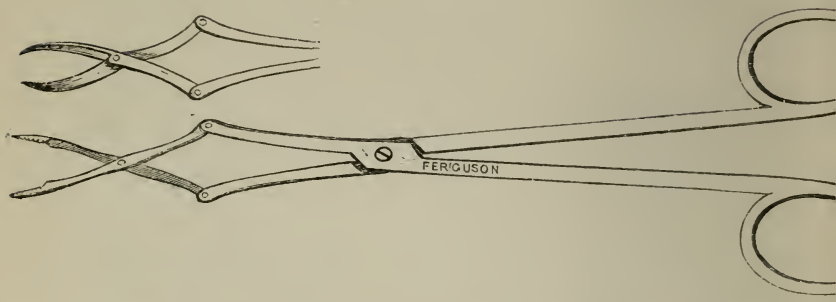
at the handle a graduated scale is fixed to show the extent of divergence of the blades, and therefore the degree of incision. It is the latter part of the instrument which was added by Krassovsky. They are intended for the division of the os and cervix in labour.

The same Professor also showed a pair of Long Scissors of Krassovsky, bent at the blades at an angle of about 90°. They are for the purpose of removing portions of any deposit or growth on the vaginal portion of the uterus, for microscopic examination during life.

The annexed sketch (fig. 188) shows a very useful pair of scissors which were exhibited by M. Mathieu, of Paris, and it will be seen that the same principle of action as is there made use of can be applied also to the manufacture of forceps: such mechanism seems to increase the delicacy of the instrument, though, perhaps,

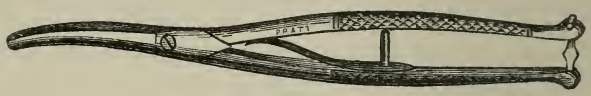
at some cost to its strength. The idea was suggested to M. Mathieu by Dr. Pfeiffer.

Fig. 188.



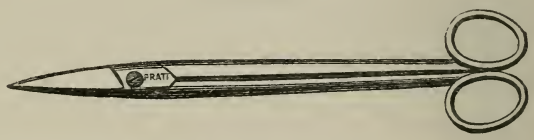
Mr. Phillip Harper's Scissors for the removal of uterine polypi are represented in the subjoined illustration (fig. 189).

Fig. 189.



And Mr. Baker Brown's Scissors for the operation of Clitorodectomy are here represented (fig. 190). They are

Fig. 190.



short and strongly made, with sharp points.

SHARP HOOK (see Crotchets).

SPECULA (see also Metroscopes).

The specula exhibited consisted of three kinds, which may be grouped together as classes. The first, *A*, was designed for visual examination of the os and cervix uteri. The second, *B*, was adapted especially to facilitate operations on the os uteri and about the vaginal canal. And the third class, *C*, admitted of the examination of these parts, both ocularly and digitally.

In the first division or class *A*, ten varieties were found:

a. Specula, consisting of 4 blades, handles, and plug.
b. „ „ „ „ „ no plug.
c. „ „ of 3 „ „ and plug.
d. „ „ „ „ „ no „
e. „ „ „ „ no handles „ „
f. „ „ of 2 „ handles and plug.
g. „ „ „ „ „ no „
h. „ „ „ „ no handles „ „
i. „ „ „ „ „ with plug.
k. „ cylindrical in form, and made in metal, ivory, and glass, these being covered with india rubber or prepared caoutchouc.

In the second class, *B*, 8 varieties were shown, and in the third, *C*, there was but one specimen.

Class A.

a. Dr. David Davis, 1830, exhibited by Dr. Hall Davis. The upper and lower blades overlap and embrace the lateral ones; they are all simultaneously opened by closing or drawing together the handles, between which a screw is placed to regulate the desired amount of separation of the blades. A chain, 5 inches long, is fastened to the extremity of each handle, and by holding this the patient can retain the instrument *in situ*, should the operator otherwise require the use of both hands.

a. Professor Ricord, Paris, 1836, exhibited by Lüer, of Paris, and Maw and Son. The blades have the same arrangement as in Dr. Davis's, but the plug is retained by means of a spring and is released by closing the handles, by which also the blades are opened.

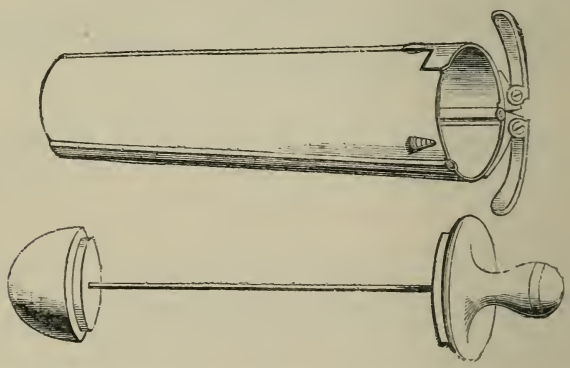
a. Professor Gio-Batta's, Bologna. Two of the four blades are shifting, so that the instrument may be used as a bi- or trivalve speculum. The handles are folding. The blades can be opened either by closing the handles, or gradually by turning a small screw placed at the junction of the handles with the blades.

b. Ricord's, made by Lüer, exhibited by Durroch. This speculum, like Professor Gio-Batta's, has two movable blades, which are kept in place by springs, and thus differ from the professor's, which are fastened by small steel nuts. The blades are opened by closing the handles.

c. Madame Boivin's, exhibited by Lüer. The third or upper blade folds within the two lateral ones; they are all opened by closing the handles, which are attached to the lateral blades. A screw is placed between the handles, and by this the blades are kept open.

c. Sir James Simpson's, exhibited by Young, of Edinburgh, and Maw and Son (fig. 191). The third blade lies within the

Fig. 191.



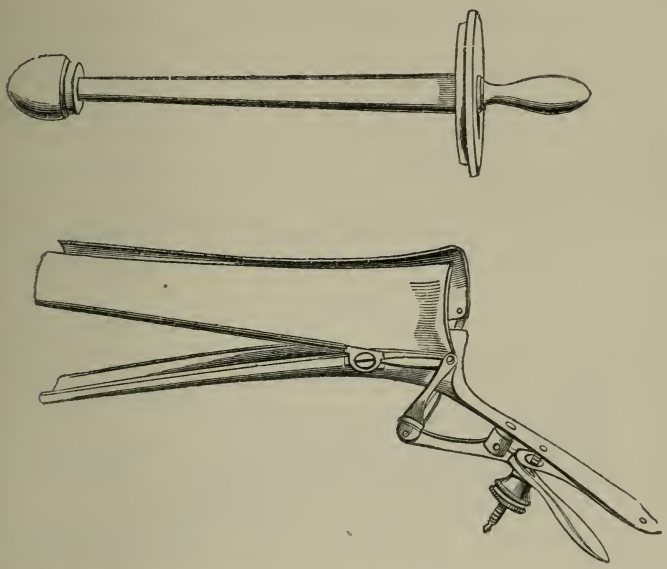
two lateral ones, as in the preceding instrument. They are opened by closing two short handles, which fold up by the sides of the lateral blades, and so makes it very portable. It is a modification and improvement of Madame Boivin's.

c. In M. Stille's, of Stockholm, the two upper blades are opened by a long screw which works under the handle of the instrument; this handle is formed by the prolongation of the third blade.

c. Fig. 192 shows an American speculum exhibited by Maw

and Son. The blades are expanded by turning the screw placed at the under surface of the handle, which is a continuation of the third or lower blade.

Fig. 192.



d. A very curious variety of the tri-valve speculum, exhibited by Professor Breslau, of Zurich. It is one of the terrible but historically curious specimens described and illustrated in the now rare book of F. Rueff, 'Ein schön læserg Trostbüchle von den Empfeugknessen eft.,' Zurich, 1554. Rueff lived in Zurich in the middle of the sixteenth century, and his book, translated in several languages, was one of the first concerning the obstetrical art.

The blades of this instrument are pointed, 3 inches long, and spring at right angles from the handle, which is heart-shaped and has a long screw running through its centre; this screw, attached to the blades, is turned by another handle similar in construction and movement to those used in the common street organs. Dr. Breslau writes to us as follows:

"Eight years ago I bought this iron instrument from an antiquary who had received it as a legacy from a physician, and I believe, judging from its form and construction, that it is an original one. I should be most happy if the Obstetrical Society

of London would not only take an interest in this specimen of mediæval obstetrical cruelty, but more if they deem it worthy of a place in their collection." The instrument is accordingly in our museum.

d. Dr. Mathews Duncan exhibited also a very ancient Speculum, in all respects like the above, with the exception of the blades being rounded at their extremities, and 4½ inches in length.

d. Weiss's Speculum, 1823. The blades are narrow and long; they are placed at right angles to the handle, which is in one piece, and contains a screw: by turning round the handle the blades are separated.

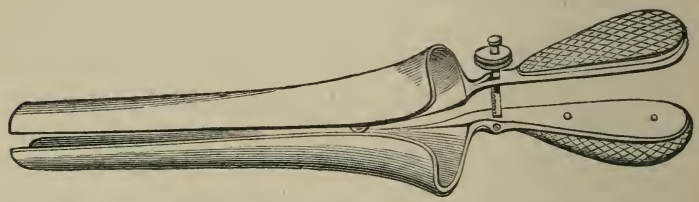
d. Weiss's Speculum and Dilator, 1823. A similar instrument, with thinner blades, and capable of dilating the female urethra, or a constricted vagina.

e. Coxeter's Screw Lever, 1850. The blades are 6 inches long, edges thin and well rounded; they each terminate in a ball point.

f. Ricord's, exhibited by Lüer. The blades are 5½ inches long, and have a graceful outward bend from the head to their extremities; they are separated by closing the handles, and are kept open by a screw attached to the handles.

This instrument is represented in the adjoining illustration (fig. 193).

Fig. 193.



g. Ricord's, exhibited by Durroch. This Speculum is gilt, the blades unite closely in their whole length, are narrow, measure 5 inches long, and are duck-bill in shape. The handles open the blades, and are folding.

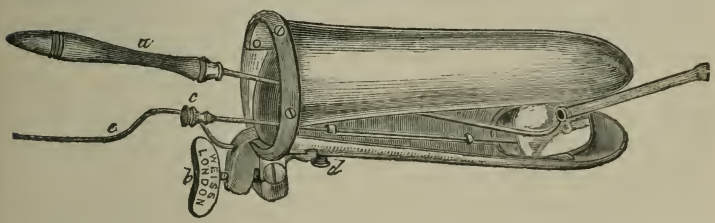
g. Dr. Cusco's, 1863, Messrs. Weiss. Blades are 1½ inches wide and 4 inches long; flat externally and internally. Each blade has a handle attached to it, and they are opened by drawing the handles together, while a screw running through one of the handles regulates the degree of separation.

g. An almost similar instrument, also by Dr. Cusco, was exhibited by Lüer. The handles are folding for convenience in carrying, and the screw is at the side of the blades.

g. Dr. Graily Hewitt's, was exhibited and made by Pratt. This speculum is a modification of Cusco's. The width of the aperture is a little increased in order to render the instrument better adapted for operative procedures, and the handles of the instrument are so fixed that it is more portable.

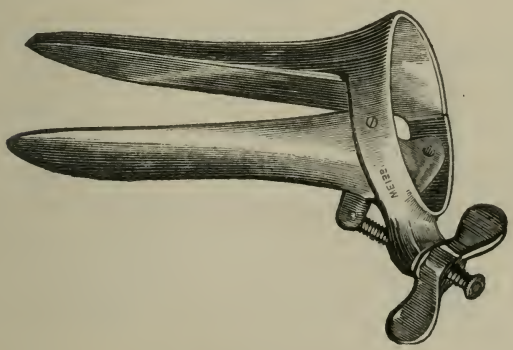
h. Dr. Tyler Smith's, made by Weiss. The blades are opened by the screw lever; they are in close apposition, and round at their uterine extremity; they are concave internally, and measure nearly 5 inches in length, by $1\frac{1}{2}$ in width. Fig. 194 shows this speculum, together with Dr. Tyler Smith's Endoscope.

Fig. 194.



h. Weiss's modification of Cusco's (fig. 195). The improve-

Fig. 195.



ment in this instrument consists in substituting a powerful screw, action for the large handles of the original speculum. The lever

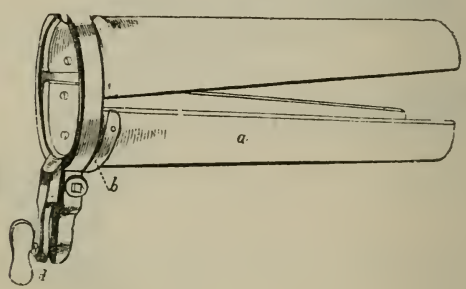
action consists of a small male screw which is hinged to the lower blade, and a fly-nut with spherical bearing. This mechanical arrangement gives considerably more power than those of other specula hitherto made, and is at the same time quite out of the way of the mouth of the instrument. Another important point about this speculum is that though the two blades meet at their extremities, there is a fenestra on either side which prevents the nipping of the vaginal wall, when closing the instrument for its removal: its entire length is $4\frac{1}{2}$ inches.

i. Messrs. Weiss also exhibited a BELL-MOUTHED SPECULUM as described in their catalogue of 1863, plate xxviii.

i. Also a similar instrument with their improved screw action, as applied to Cusco's speculum; by both these instruments an extensive view of the parts can be seen, owing to the width of the mouth, which is $2\frac{1}{2}$ inches in diameter, and round in shape.

i. SCREW-LEVER SPECULUM of COXETER, 1846. The dilatation of this instrument is effected by means of a screw lever. The shape of the blades is such, that when expanded, the vaginal folds will not fall in and obstruct the sight. The instrument can be thrown completely open, and thus readily cleaned. It is very portable, and, when required, is fitted with a plug, so arranged as to contain caustic case, lancet, and sponge-holder, and fitted in a neat leather case the size of the speculum (fig. 196).—*a.* Dilating blade. *b.* Frame embracing the blades. *d.* Screw bearing on the lever which opens the blades.

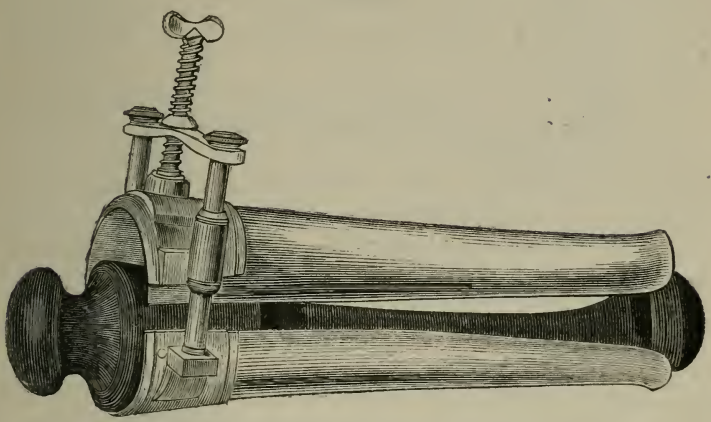
FIG. 196.



i. From Lisbon, 1830, invented by JOAQUIN DA ROCHE MAZAREM. A very curious instrument; the two blades open

parallel to each other, one being raised from the other by means of a screw, as shown in the woodcut (fig. 197).

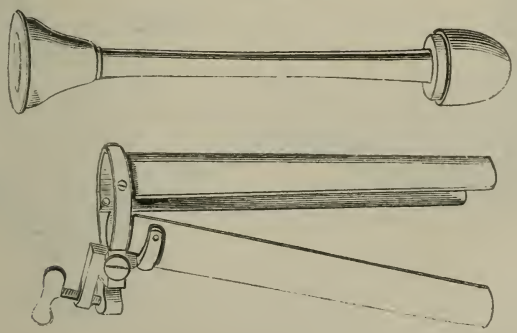
Fig. 197.



The principle of this speculum is good, as the external opening is equal to the uterine, admitting of the same space from one extremity to the other.

i. Dr. Henry Bennet's, was exhibited by Coxeter and by Maw and Son (fig. 198). The blades are flattened at their uterine extremity, and are opened by the ordinary screw lever.

Fig. 198.



k. Professor Lazarewitch's, of Charkoff, Russia, was exhibited by himself. Made of brass or zinc, covered on the outside with

black and on the inside with white varnish. Such a speculum is very durable, may be kept clean, and admits of accurate and clear lighting of the inspected object. The form of the speculum is cylindrical; the inner end of it, intended for introduction, is cut obliquely, and the edge turned slightly inwards; the edges of the outer opening are bent outwards.

k. Ferguson's Ivory Speculum. This is well adapted for the use of the actual cautery to the os and cervix uteri.

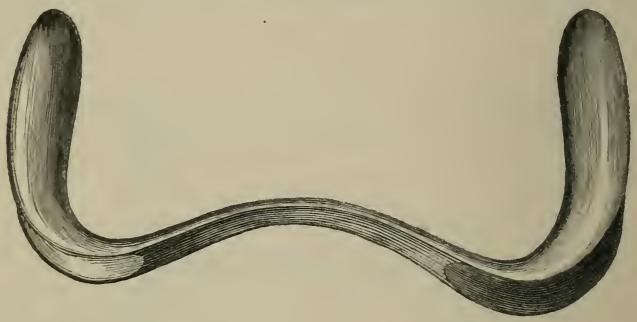
k. Ferguson's Glass Speculum, coated over with a thin layer of india rubber. This instrument is a very useful one, possessing great reflecting power, and capable of always being kept perfectly clean and bright; for ordinary use, Dr. Churchill has found this speculum (of different sizes) the most useful.

Class B.

These specula are intended more especially for examinations and operations about the vagina.

I. Dr. Marion Sims' Duck-bill Speculum, exhibited by Messrs. Mayer and Meltzer (fig. 199), may be considered to

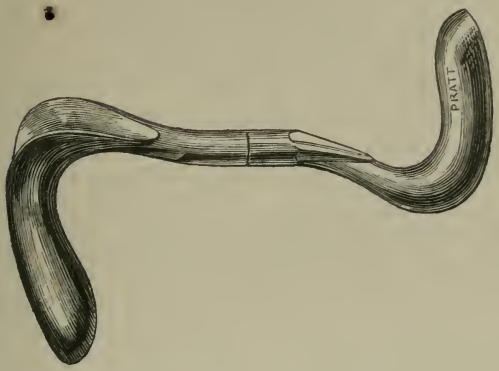
Fig. 199.



hold the first place. It is formed of metal and is generally electro-plated, between 8 and 9 inches long; both ends turn in the same direction, one being smaller than the other; they are both sections of a cylinder, the concavity looking outwards.

1. Mr. Pratt's modification of Sims' Speculum (fig. 200).

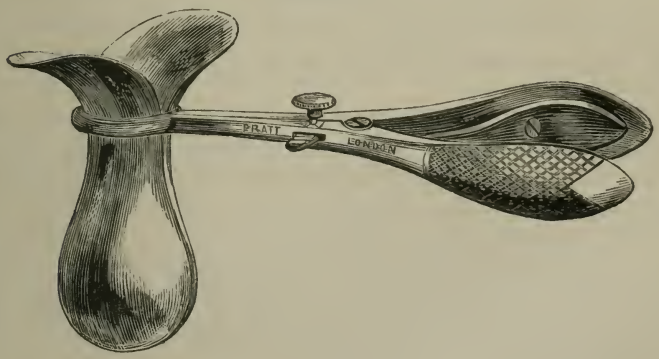
Fig. 200.



This valuable instrument is rendered very portable and more easy of application. By means of a central screw the two blades divide and fit into a small case, and instead of both blades turning in the same direction, they are in shape, when together, somewhat like the letter Z: for practical purposes this is thought to be a great improvement.

2. Dr. Tanner's Speculum, made and exhibited by Pratt, is here represented (fig. 201). This is a double spoon-bowl

Fig. 201.



speculum, jointed at the handles so as to open like a pair of

scissors; the handles are at right angles to the blades, which are kept open by a set screw. It is useful for exploring the vagina where fistulæ exist or are suspected, and also for small operations in this locality, as by its bulbous extremity and narrow neck it keeps *in sitû* without assistance.

3. Hilliard's, exhibited by Ferguson. This speculum is composed of 4 flat pieces of metal, the two inner folding within, the outer like an inverted capital M; when opened by means of the handles and a screw placed between them, the blades form three sides of a square, thus ⊔.

4. A Speculum was exhibited by Durroch, and considered to be of American origin It consists of four rods, each bent at their uterine extremity; they have each a separate screw, by which any single one may be extended upwards and downwards without any movement of the others; there are two handles, which are so fixed as to open the blades laterally. By means of this instrument the whole vaginal canal may be seen with perfect ease.

5. Beaumont's, of Toronto, was exhibited by Ferguson. This instrument has a horse-shoe base, from which five blades slide at right angles; each blade is 4 inches long and ½ inch wide; they each have a screw which regulates their opening, each blade having to be opened separately.

6. The Vaginal Retractor of Dr. Simon, of Bostock, exhibited by M. Stillé, consists of two handles, one 11, the other 8½ inches long, each curved at one extremity, and at the other having a spring so arranged as to seize one of six different-sized blades, some concave and resembling Dr. Marion Sims', others perfectly flat.

The object of this instrument is the same as Dr. Sims', but it is thought to be an improvement on his in having the handles separate and longer, by which the instrument can be held *in sitû* perfectly free for any operation.

7. A Curved Vaginal Spatula of M. Jobert, of Paris, 1845, was exhibited by Lüer. This consists of two separate blades with wooden handles, each having a different curve. One of the blades is quite flat, and 6 inches long; the other resembles a duck's bill, and is 5½ inches long.

8. Mr. Ferguson exhibited two Vaginal Retractors with blades both alike, 5 inches long, and having their external surface concave.

Class C.

I. Dr. Protheroe Smith's was exhibited by Mr. Ferguson, in a case with caustic holder and scarificator.

This Speculum consists of two cylinders, the inner made of glass, covered with india rubber, the outer of metal gilt, having an oval aperture of nearly 3 inches long at its lower half. After the instrument is introduced, the inner speculum is withdrawn entirely or partially, and the finger can then be passed externally along the vaginal wall, through the fenestrum, to the os and cervix uteri, thus combining the advantages of a digital and visual examination.

SPONGE-HOLDERS (see Miscellaneous).

SPONGE-TENTS (see Miscellaneous).

STETHOSCOPES.

Dr. Mattei exhibited a very portable form of Stethoscope. The materials of which it was composed were caoutchouc and brass, the latter forming, as it were, a framework for the former. The end to be applied to the ear consists of a circular plate of brass, which works on a sort of pivot, so that it may be folded flat and parallel with the length of the instrument, and the same applies to the other end of the instrument; so that when both ends are thus turned down, the entire instrument becomes quite flat, and but for its length might go into the waistcoat pocket. The centres of the two extremities are connected by means of a brass wire or rod, and upon this the ends turn by joints. When the ends are turned so as to be horizontal and at right angles to the tubes, the intervening caoutchouc case is put on the stretch, and then its shape resembles that of our ordinary stethoscope, the brass framework not being seen. The end applied to the chest is infundibuliform, and the whole instrument forms a sort of acoustic chamber. By an ingenious contrivance in the shape of a tube affixed at the side for insufflation, the caoutchouc walls can be tightened at will by blowing into the instrument; this renders it still more delicate as a measure of sound.

Professor KÜNEKE exhibited his DOUBLE STETHOSCOPE FOR THE DIAGNOSIS OF TWIN PREGNANCY. It consists of two india-rubber tubes, one for each ear, the opposite ends being placed over the gravid uterus. Then, by comparing the frequency, force, and especially the locality of any given sounds, the diagnosis is arrived at.

SUPPOSITORIES (see Pessaries, Medicated).

SYRINGES (see Douches, Enema Syringe, Miscellaneous, and Instruments for the Induction of Premature Labour.)

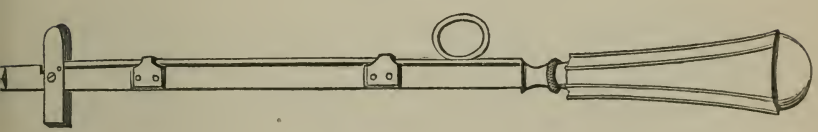
TIRE-TÊTES.

These compound instruments combine the PERFORATOR and EXTRACTOR.

ASSALINI again sets the pattern of these. His trepan-perforator being withdrawn from the canula after having taken out a piece of bone, he then passed through the canula a sort of key or olive consisting of a bar, which, when admitted into the skull, could be made to stand at right angles to the stem; it was then rotated to break up the brain; and next laying across the opening in the skull it served to draw the head down into the vagina. When in the vagina, he seizes the head with his fingers. The instrument had therefore no great power as a tractor. In cases requiring more power he used his compressor-forceps, or the following contrivance, which he thought was especially adapted to the extraction of the head when left behind in the uterus separated from the body. This was a kind of anchor which was passed through the same canula which had served for the trepan. Branches then opened and spread out inside the skull. To the shank was attached a string upon which traction was made. (See 'Nuovo Stromenti,' &c.)

The TIRE-TETE of Professor RIZZOLI is represented in this sketch (fig. 202). As will be seen, it is also a perforator, the tire-

FIG. 202.



tête being formed by the cross-bar portion, which is placed at right angles to the shaft of the instrument by pulling down the ring represented on the upper part of the drawing.

A NEW PERFORATING-TRACTOR by F. W. DUNNE, M.R.C.S., was exhibited by Mr. Dunne. It is an instrument designed on the same principle as Assalini's. After perforation, a shifting

bolt causes two or four blades to expand within the cranium at right angles to the stem. These blades thus resting in the cranium form the anchor-like hold for traction.

In another instrument, exhibited by Ferguson, a Screw Perforator is combined with a crotchet or anchor-like extractor. A strong perforating screw terminates a straight stem. Below the screw is an anchor-like crotchet which lies flat in contact with the stem until perforation is effected. Then, by means of a sliding-bar running along the stem, the anchor can be made to project at right angles, taking a hold inside the skull in order to extract.

This curious instrument, reminding one of Assalini's contrivance, was designed by a provincial surgeon who gave it to the late Mr. Earle, of St. Bartholomew's.

The Tire-tete of Grégoire was exhibited by Dr. Matthews Duncan, Honorary Fellow of the Society.

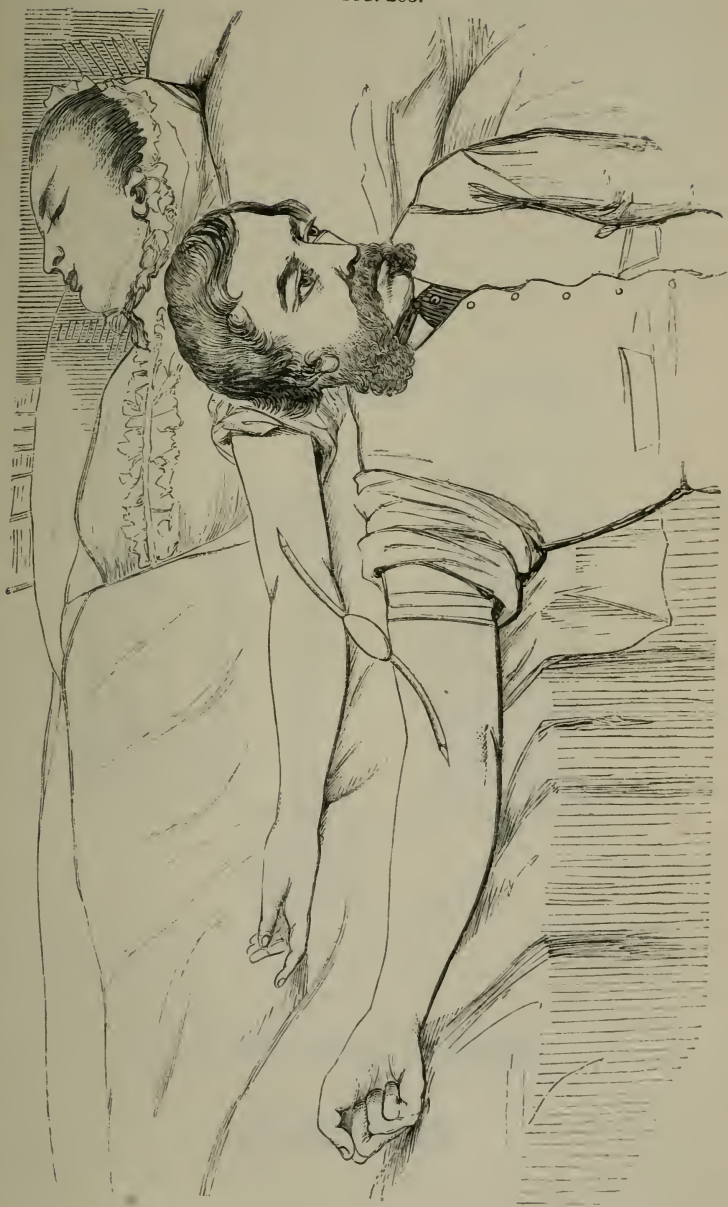
Dr. R. Wallace Johnson's Tractor is similar in principle to Assalini's anchor-tractor. It is called a "blunt-hook." It consists of a slender stem, terminating at one extremity in a curve having an eye; at the other bearing a transverse bar set on a joint which admits of the bar being folded so as to form a line with the stem, and thus allowing it to be introduced through an opening in the cranium. When inside, the bar rides away from the stem, and stands at right angles with it, taking a hold on the inner surface of the cranium.

TRANSFUSION, Instruments for.

Prof. Martin, of Berlin, exhibited his instrument, which consists of a small flattened trocar and canula for puncturing the vein, the canula being adapted to the syringe.

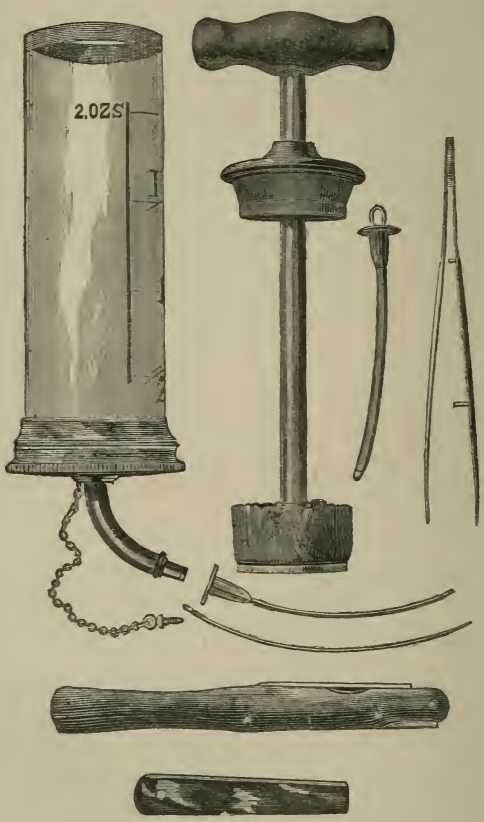
Dr. Aveling exhibited his apparatus for immediate transfusion, described by him June 1st, 1865, 'Obstetric Transactions.' It consists of a small elastic tube having a dilatation in the middle without valves. To each end of the tube is attached a small silver tube to enter the vein. After opening the veins of the giver and receiver, one end is inserted in each. It is proper to place the tube in water first, and by compressing the dilated part to expel all the air. The plate (fig. 203) explains the mode of using.

Fig. 203.



Dr. Graily Hewitt showed the apparatus described by him in ' Obstetrical Transactions,' 1865. It consists of a glass syringe holding two ounces, into which the blood is directly received. The piston is taken out, the open end inverted over the opening, the edge pressing firmly on the proximal side of the vein, while the distal side is scarcely at all so, only sufficiently to prevent the blood escaping. When sufficient blood is received into the syringe it is immediately removed, the piston applied and the tube inserted into the end of the canula, which has already been placed in the vein of the patient in the usual manner.

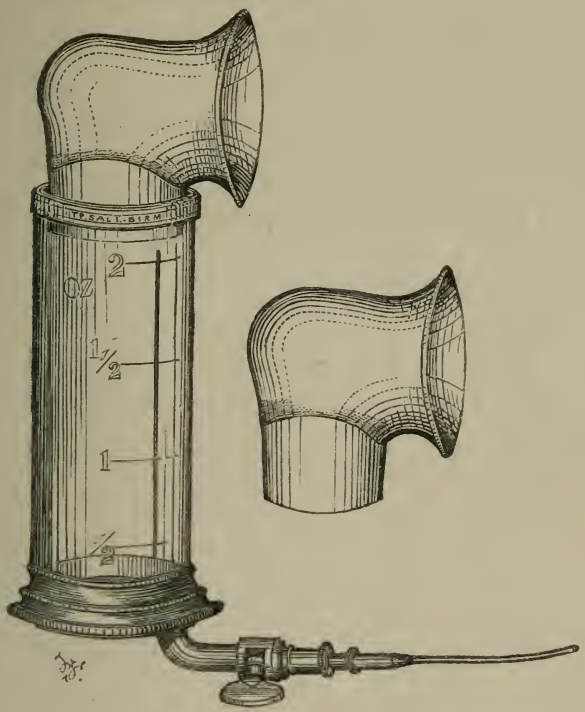
Fig. 204.



The case contains the syringe, two canulas with plugs, a pair of small dissecting-forceps, a sharp cutting scalpel, and common lancet.

Dr. Earle exhibited his modification of Dr. Graily Hewitt's Transfusion Apparatus.

Fig. 205.



The author states that, during the filling of the glass syringe with blood, it is absolutely necessary that it should be held in the horizontal position, as recommended by Dr. Graily Hewitt. If it were to be held vertically, the blood which first issued from the supplying vein would at once pass into the escape-pipe, and be liable, from its coagulation, to obstruct the subsequent injection of the blood. It might be held inverted over the arm of the person supplying the blood, and the blood be allowed to well up into it, but there would be the risk of losing the blood either from the mouth

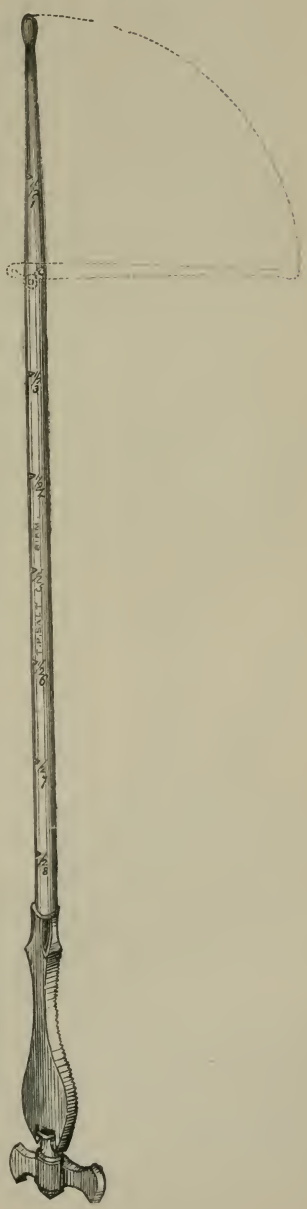
of the syringe not fitting closely to the surface of the skin, or from the individual fainting.

It being, therefore, a *sine quâ non* that the syringe should be held horizontally, Dr. Earle has added a small movable funnel to the mouth of the syringe, for without it it would be impossible to fill the syringe in a horizontal position; the blood would flow out as quickly as it passed in. Next, he has substituted a stopcock for the stopper to the orifice of the escape-pipe. When the syringe is sufficiently filled the stopper has to be removed to enable the canula to be inserted, and, in consequence, a certain amount of blood is lost. This is prevented by the stopcock. Besides, the stopcock can be worked with the canula already appended to the escape-tube, which would save a little of the time which is so precious in this operation. The stopcock has been made in such a manner that the calibre of the escape-pipe has not been in any way diminished. Lastly, he has had the escape-pipe removed from the centre and brought as near as possible to the margin, in order to prevent any blood from passing into the escape-tube until a short time before the injection is actually commenced—a point upon the importance of which it is needless to comment.

UTERINE SOUNDS.

The uterine sound, it may be thought, is too simple an instrument to admit of much variation. Nevertheless, there were some modifications, of which the following were the most noteworthy; mere differences in size, in curve, in length, &c., it is scarcely necessary to remark upon.

Fig. 206.



Dr. Lumley Earle exhibited a modification of the Uterine Sound, in that it was jointed at about $2\frac{1}{2}$ inches from the extremity. The instrument, which is represented in the annexed sketch (fig. 206), is not intended to supersede the common sound in ordinary cases, but is thought to be specially useful in restoring the retroverted or anti-verted uterus to its proper position in a natural manner, without twisting the misplaced organ. At the handle end of the sound is a screw, by means of which the jointed portion is put in motion at the other extremity, and so can be made to form either a right angle with the shaft, or any other angle between that and the straight line.

The instrument was invented by Dr. Earle in 1864, and is described in the 'Medical Times and Gazette,' June 18th, 1864.

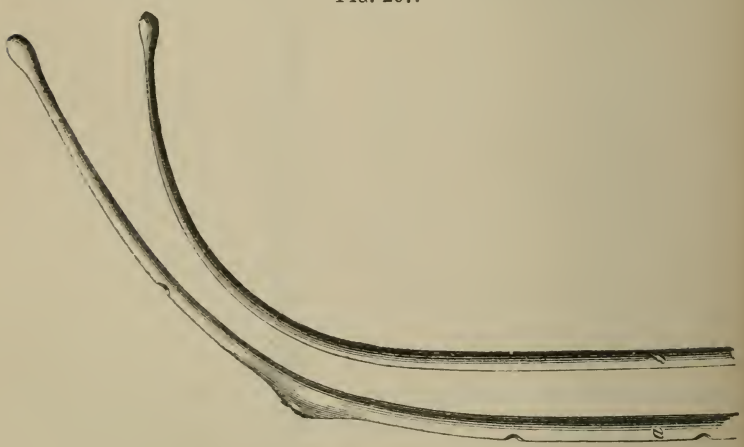
The Uterine Sound of Professor Lazarewitch consisted of a steel rod $9\frac{1}{2}$ inches long, the two ends of which were bent in opposite directions in the form of

the letter S; one end was shaped like the ordinary sound, the other was flattened like a small oval spatula. The former was measured off into centimètres, and opposite the 6th, 7th, and 8th centimètres were three small elevations, while opposite the 9th, 10th and 11th were notches; these differences being intended to facilitate the measurement of the uterus without the withdrawal of the sound. The spatula-shaped end readily indicated any change in the direction of the instrument, and, more than that, according to the author, if the handle is introduced into the cervical canal, and by its means the anterior is separated from the posterior wall, then it is possible to see either of them on the polished surface of the concave side of the handle. Thus, the instrument becomes also an intra-uterine speculum.

Professor HAARKE, of Leipsic, exhibited an instrument jointed in precisely the same way as that of Dr. Earle, with this exception, however, that, though jointed, there was no means of acting upon this when introduced. The joint was a simple hinge-joint, and was unconnected with any screw for its adjustment.

Dr. J. MARION SIMS' UTERINE SOUND is represented in this sketch (fig. 207), with what he calls his UTERINE PROBE, which is

FIG. 207.



the innermost and more curved of the two. It is made of virgin silver or annealed copper, silvered, smaller than the ordinary sound, and without notches. They are represented here as the natural size.

VACCINATOR.

A most ingenious instrument for vaccination, invented by M. Chassagny de Lyon, was exhibited. It was about the size and had much the appearance of an ordinary pocket pencil-case or penholder. At one end of it was a small brass tube about half an inch long, somewhat pointed; its internal diameter was of almost capillary fineness, and it was observed that on pressing this glass end of the instrument upon the hand, the glass portion receded by a sort of spiral spring within, in doing which it exposed two exceedingly minute steel points, looking each about the size of the sting of a wasp, and correspondingly sharp.

The use of the instrument was thus explained: The little glass tube is first charged with vaccine by capillary attraction, by merely placing it on the punctured vaccine vesicle. Thus charged, the same end is pressed upon the arm to be vaccinated, the glass recedes, the two little steel fangs protrude, and are forced into the arm, carrying with them the vaccine by which they are surrounded in the tube, and the operation is complete.

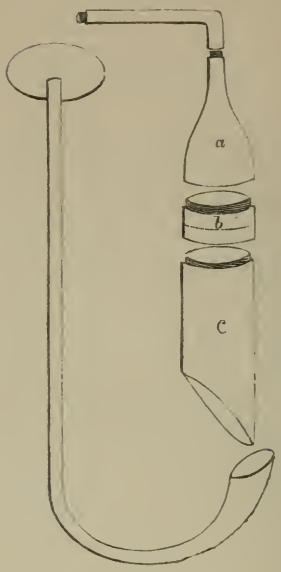
The instrument is at once ingenious and effective.

VAGINOSCOPE.

Dr. Routh's Vaginoscope, made by Coxeter, consists of four parts: 1. A vaginal-end shaped like an ordinary speculum (*c*). 2. A cup-shaped end (*a*). 3. Between the two a circular piece (*b*), on which may be placed a tense membrane. 4. To the end of the cup-shaped portion an elastic tube, or a solid tube bent at right angles and terminating by an ear-piece, as in ordinary stethoscopes, may be placed. Fig. 208 represents these parts.

If the vaginoscope is made of *glass* (as in that made by Maddox), it is bent upon itself, and the distal end bevelled off, as is represented in the above sketch.

Fig. 208.



VECTIS OR LEVER.

Two specimens of Dr. Bland's were exhibited, one by Dr. Cory, the other by Dr. Matthews Duncan, date 1794. This instrument consists of a flat piece of steel, 15 inches long, about $\frac{1}{10}$th inch thick, and $1\frac{1}{2}$ inch wide, rounded off at each end, one of which is rather wider and fenestrated.

A Vectis tractor, of a very early period, was exhibited by Dr. Radford.

It had the ordinary handle and shank, but the blade was about 1 inch wide equally throughout, $\frac{1}{8}$ inch thick, 5 inches long, without any fenestrum, and well curved throughout its whole length.

Another Vectis tractor of early form was exhibited by Dr. Radford; it was similar to the last, except that the blade was not of equal width throughout, but dilated gradually till it rounded off at the end.

Aitkin's "Lining lever" was exhibited by Dr. Matthews Duncan.

The upper half of the blade is capable of being made straight or bent at any point between the ordinary curve, by a joint which was acted upon by a screw, running up the handle shank and lower part of blades, which was covered with leather—about 1784.

Vectis, of Dr. Dieger, 1833, was exhibited and made by Nyrop, Copenhagen; it was of ordinary form, excepting in two particulars. First, the end of the blade, instead of containing the ordinary curve, which it had observed to within an inch of the end, turns slightly back. Second, the handle is divisible into two parts, one of which can be attached by a ring to the shank, and with a joint to place it at any angle to the same.

The Vectis tractor of Dr. Uvedale West was exhibited by himself.

This vectis is proposed by the inventor as being likely to possess all the advantages of the ordinary vectis, with the addition of some of those of the loop; the principal modification consisting in a greater width of blade, or rather of *fenestra*, so that a considerable breadth of the fœtal head is grasped by it, as well as hooked, so to speak, by the beak. From possessing a more slightly curved beak than the vectis in ordinary use, Dr. Uvedale West remarks that it is more easily introduced, while, in consequence of an appreciable breadth of the head sinking into the fenestra, it is even less likely to slip. Fig. 209 represents the instrument flat, and fig. 210 in profile.

Fig. 209.

Fig. 210.

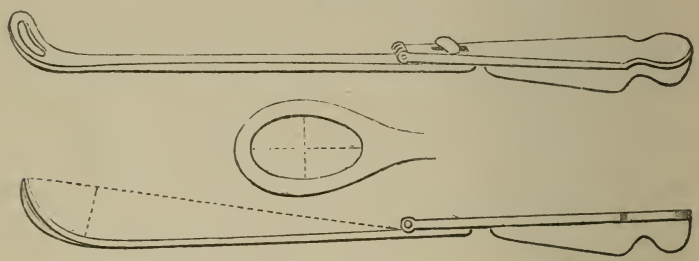
Two Vectes of Professor Fabbri, of Bologna, were exhibited by himself. Both were of the same width of blade, length, and size of fenestrum. The shank and lower half of the blade curving

backwards in both; but in one the upper half curves forwards, while in the other it becomes straighter, but does not curve forwards.

Dr. Ogden's (of Manchester) Tractor or Vectis was 16 inches long, having a joint between the shank and the handles; it was considerably curved near the upper end, which does not so gradually widen as the ordinary fenestrated forms; but within 3 inches of the end it rather quickly expands into a blade, $2\frac{1}{2}$ inches at its widest part, with an almost oval fenestrum.

The accompanying illustration shows the general shape and form of the instrument, the degree of curvature, and the position of the opening.

Fig. 211.



A Vectis, modified by F. Symonds, Esq., was exhibited by Coxeter.

It had a joint at the junction of the shank with the handle, the blade being much curved.

A Vectis with joint in the same position as the above, a very early specimen, was exhibited by Dr. Cory.

The ordinary forms of curved fenestrated vectis were exhibited by Drs. Cory, Radford, Coxeter, and many others.

One of those of old date exhibited by Dr. Cory possessed two holes between the shank and fenestrum.

The Levier tubulé (perforated vectis) was exhibited by Charrière, and was invented by Dr. Martin-delaplaque.

The blade was gently curved and tubular, having apertures on the convex face and inside of the fenestrum; the shank and handle were also tubular to convey fluids. Length 15 inches, shank and handle $12\frac{1}{2}$ inches, widest part of blade 2 inches.

VESICO-VAGINAL FISTULA, Instruments for.

Many very ingenious instruments connected with this operation were exhibited by various authors and instrument makers. Their ingenuity being displayed partly in the instrument used for preparing the edges of the fistula, but chiefly in the means by which those edges were either brought together or secured. Hence a variety of very clever contrivances in shape of needle-holders, wire-adjusters, clamps, &c., employed in this operation.

Dr. MARION SIMS exhibited in this department a TENACULUM, BLUNT HOOK, WIRE-ADJUSTER, and NEEDLE-HOLDER, all made by Messrs. MAYER and MELTZER. The latter instrument consisted simply of a pair of long forceps, the blades being flat, closely opposed and dentate, so that they secure a firm hold of the needle between the teeth, and by a simple catch at the handle the two limbs are locked together, and the forceps and needle thus become, as it were, one instrument, which can be manipulated with facility.

His WIRE-ADJUSTERS were made of different forms; some resembled a miniature fork, the wire passing between the prongs; others were small circular disks of metal, the wire passing through a hole made in the middle of the plate; all being fixed in long handles for the convenience of the parts operated upon.

The BLUNT-HOOK consisted merely of a small probe-pointed steel rod, turned nearly at a right angle. This instrument is intended for the manipulation of parts which the finger either cannot reach, or only with great difficulty.

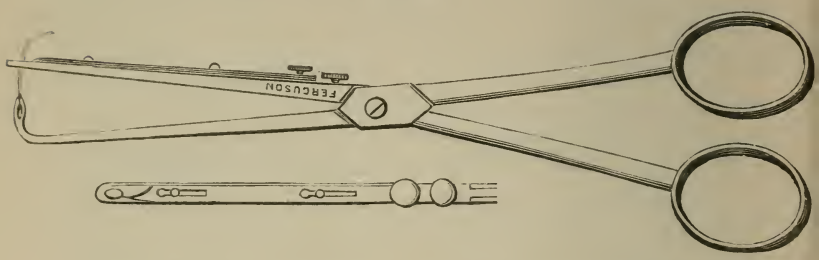
The TENACULUM is a small delicately fine-pointed instrument, the point being at right angles with the stem, for the purpose of hooking down any parts within manipulation reach.

Some instruments of a similar kind were exhibited by M. STILLÉ, of Stockholm, together with some ingenious needles fitted with long handles, their extremities being bent at various angles and notched on one side so as to carry the wire easily through the parts without being actually threaded before introduction, the advantage of this being the facility with which the wire can be inserted and the needle withdrawn from the parts. Thus the needle is first passed through the part to be sewn, then, while

in situ, the wire is passed into the notch, and by withdrawing the needle the wire is drawn through and so fixed in the parts.

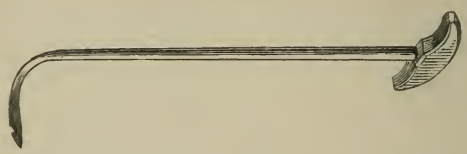
Dr. Beaumont's Needle for vesico-vaginal fistula is represented in this illustration (fig. 212).

Fig. 212.



Dr. F. Bird's needles for vesico-vaginal fistula, were exhibited by Pratt, Oxford Street.

Fig. 213.



The engraving shows one of these (they are made right and left), with a cross handle, and provided with a notch close to the point. Dr. Bird prefers to close the edges of the wound in vesico-vaginal fistula, without the aid of a speculum. Thus with one of these needles in one hand and the finger extended towards the point, he is able to pass the needle through the edges of the wound; then with the forefinger of the other hand he carries up the wire and hooks it on to the point of the needle, then by a quick backward movement of the needle the wire is pulled through. The object sought is not unduly to stretch the parts, as may be the case where the speculum is used.

Dr. Aveling showed his shot-punch. By means of a screw a piece of hard steel wire is made to perforate a shot. The inventor uses pierced shots to secure sutures in vaginal operations.

He also exhibited his COIL CLAMP. This little instrument was invented in 1863, to render the removal of sutures in vaginal operations more easy. It is made by winding a piece of ordinary iron wire (No. 28) round a pin, until a coil half an inch long is made. The ends are then cut off smooth. When the suture has been passed the coil is run down over its ends to the lips of the wound. A perforated shot is then also passed over, and by means of a pair of strong forceps, carried on until the coil has been pressed low enough to tighten the suture. It is then to be crushed and all is secure. By a simple clip of the scissors across any part of the coil, the ends of the suture are at once set at liberty, of sufficient length to enable the operator to bend them back and withdraw them easily.

Dr. ROUTH exhibited his TWO NEEDLES FOR VESICO-VAGINAL FISTULA. The ends are bent like a corkscrew $1\frac{1}{2}$ turns, but each in opposed directions. These needle ends are fastened to a long handle.

A BELT, to the front part of which is attached (by a ball-and-socket joint, and a regulating screw) a catheter-holder to retain the catheter *in situ*, after the operation for vesico-vaginal fistula, in those cases where the urethra has been much injured, was exhibited by Mr. Pratt. This ingenious arrangement is the invention of Mr. PHILIP HARPER.

WOMB-SUCKER.

The Womb-sucker (Der Gebärmattersauger, Turjau d'aspiration pour la matrice), of Dr. Charles Hennig, 1862, was exhibited by the author.

This syringe is constructed, 1st, for sucking the tough phlegm out of the canal of the cervix uteri when affected with leucorrhœa, in order to clear the mucous membrane of the cervix before using stringent drugs, and to lessen the size of the cervix when dilated.

2nd, for sucking blood from the os uteri after scarifying it—a sort of artificial leech. In using it, the cervix is to be taken into the cup of one of the vulcanized india-rubber tubes, and its small end is to be screwed into the hard-rubber or any other syringe, then the piston of the hard-rubber syringe must be gradually pulled. Each number of the tubes corresponds to one of the different sizes of the portio vaginalis; that *with the glass tube* is suited for appliance *in a speculum*. (The small hard-rubber tube is a surplus without reference to the aim in question.)

LIST OF EXHIBITORS.

BRITISH.

Aveling, Dr., 15, Howard Street, Sheffield.

Bailey, Henry Woodruffe, Esq., Thetford, Norfolk.
Barnes, Dr. R., Finsbury Square, London, E.C.
Beattie, Dr. Thos. Edward, Dublin.
Bell and Co., Oxford Street, London, W.
Brown, J. B., Esq., Upper Harley Street, London, W.
Brooke, Ch., Esq., Fitzroy Square, W.
Bryant, Dr. W., 23a, Sussex Square, Hyde Park Gardens, London, W.

Chambers, Thomas, Esq., Sutherland Street, London, S.W.
Cooper, Mr., 26, Oxford Street, London, W.
Cory, Dr. C. F., 8, Nassau Place, Commercial Road East, London, E.
Coxeter, Mr., 23, Grafton Street East, London.

Davis, Dr. John Hall, Harley Street, Cavendish Square, London, W.
Duncan, Dr. Matthews, Heriot Row, Edinburgh.
Dunne, F. W., Esq., Water Lane, Brixton, London, S.
Durroch, Mr., 3, St. Thomas's Street, Borough, London, S.E.

Earle, Dr. J. Lumley, 92, Newhall Street, Birmingham.
Eastlake, Dr., Welbeck Street, Cavendish Square, London, W.
Ellis, Robert, Esq., Sloane Street, London, S.W.

Ferguson, Mr., 21, Giltspur Street, London, E.C.

Gayton, Dr., 85, Brick Lane, Spitalfields, London.
Giles, Dr., Clifton Villa, Victoria Park Road, Hackney, London, N.E.
Greenhalgh, Dr., Grosvenor Street, Grosvenor Square, London, W.

Harper, Philip, Esq., 30, Cambridge Street, Hyde Park, London, W.
Hewitt, Dr. Graily, Berkeley Square, London, W.
Hicks, Dr. J. Braxton, St. Thomas Street, Southwark, London, S.E.
Hilliard, Mr., 65, Renfield Street, Glasgow.
Hutchinson, Mr., 36, Duke Street, Sheffield.

Khrone and Sesemann, Messrs., 241, Whitechapel Road, London, E.

Ladd, Mr. W., Beak Street, Regent Street, London, W.
Locock, Sir Chas., Bart., Hertford Street, May Fair, London, W.

Matthews, Mr. G., Portugal Street, Lincoln's Inn Fields, London, W.C.
Mayer and Meltzer, 51, Great Portland Street, London, W.
Maw and Son, 11, Aldersgate Street, London, E.C.
Meadows, Dr., 27, George Street, Hanover Square, London, W.
Merriman, Dr., 13, Godolphin Road, New Road, Hammersmith, London, S.W.
Middleton, Dr., Brussels.
Murphy, Dr. E. W., 73, Harley Street, Cavendish Square, London, W.

Newham, S. Esq., Angel Hill, Bury St. Edmunds, Suffolk.

Ogden, Dr., Manchester.
Oldham, Dr., Finsbury Square, London, E.C.

Powell, Mr., 50, Neate Street, Albany Road, London.
Pratt, Mr., 420, Oxford Street, London, W.
Priestley, Dr. W. O., Hertford Street, May Fair, London, W.

Rasch, Dr., 7, South Street, Finsbury Square, London, E.C.
Radford, Dr., Moor Field, Higher Broughton, Manchester.
Richardson, Dr., 12, Hinde Street, Manchester Square, London, W.
Robbins, Messrs., Oxford Street, London, W.
Roberton, John, Esq., 333, Oxford Street, Manchester.
Roper, Alfred George, Esq., 180, Shoreditch, London, N.E.
Routh, Dr., Montagu Square, London, W.
Russell, Mr., 58, George Street, Portman Square, London, W.

Salmon, Mr., 32, Wigmore Street, Cavendish Square, London, W.
Salt, Mr., Birmingham.
Sansom, Dr., Duncan Terrace, Islington, London, N.
Savage, Dr., Samaritan Hospital, Edwards Street, Portman Square, London, W.
Skinner, Dr. T., 1, St. James' Road, Liverpool.
Simpson, Sir J. Y., Bart., 52, Queen Street, Edinburgh.
Smith, Dr. Tyler, Upper Grosvenor Street, Grosvenor Square, London, W.

Tanny, Mr., 58, North Bridge, Edinburgh.
Traer, J. R., Esq., 47, Hans Place, London, S.W.

Way, Dr., Eaton Square, London, S.W.
Wells, Spencer, Esq., Upper Grosvenor Street, Grosvenor Square, London, W.
Weiss and Son, Messrs., Strand, London, W.C.
West, Dr. Uvedale, Alford, Lincolnshire.
West, Mr. F. L., Cockspur Street, London, W.C.
Wicker and Blaise, Messrs., St. James's Street, London, S.W.
Woodward, Dr., 22, Foregate Street, Worcester.

Young and Son, Edinburgh.

FOREIGN.

Boujalsky, Prof., St. Petersburg.
Braun, Prof., Vienna.
Breslau, Prof., Zurich.

Charrière, M., 6, Rue de l'École de Médecine, Paris.
Chassagny de Lyon, Charente.

Depaul, Prof., Paris.

Fabbri, Prof., Bologna.
Faye, Prof., Christiania.

Germann, Prof., Leipzig.
Giordano, Prof., Turin.

Haake, Dr., Leipzig.
Hardon, M., Rue Neuve St. Étienne du Mont, Paris.
Helfer, Dr., Leipzig.
Hennig, Prof., Leipzig.
Hornn, Prof., Leipzig.
Howitz, Dr., Copenhagen.
Hugenberger, Prof., St. Petersburg.

Küneke, Prof., Göttingen.

Krassovsky, Prof., St. Petersburg.

Lazarewitch, Prof., Charkoff, Russia.
Lazzati, Prof., Milan.
Lollini, Frères, Bologna.
Lüer, M., 19, Rue de l'École de Médecine, Paris.
Lutter, M., Berlin.

Mathieu, M., 28, Rue de l'Ancienne Comédie, Paris.
Martin, Prof., Berlin.
Martin, Dr. Ed., Jun., Berlin.
Mattei, Prof., Paris.
Meissner, Dr.
Mette, M., Christiania.
Mondotte, Dr., Marennes.

Nyrop, Prof., Copenhagen.

Rizzoli, Prof., Bologna.

Scanzoni, Prof., Würzburg.
Sims, Dr. J. Marion, New York.
Smith, —, Esq., Christiania.
Stillé, M., Stockholm.

Thomas, Prof. Simon, Leyden.

Verrier, M., Paris.

LIST OF INSTRUMENTS

PRESENTED TO THE SOCIETY'S MUSEUM.

	Presented by
Abdominal Bandage for Hæmorrhage	Prof. Giordano.
„ „ Bigg's	Mr. Heather Bigg.
„ Truss	Maw & Son.
Abortion Forceps	F. W. Dunne.
Blunt Hook, Radford's	Dr. Radford.
Cephalotribe, Hennig's	Prof. Hennig.
„ Depaul's	Charrière.
„ Assalini's	Lollini.
„ Rizzoli's	Prof. Rizzoli.
Craniotome, ditto	Ditto.
„ and Tire-Tête, ditto	Ditto.
Crotchet, Radford's	Dr. Radford.
Craniotomy Forceps, Barnes'	Maw & Son.
„ „ Sir J. Simpson's	Ditto.
„ „ Hall Davis's	Ditto.
„ „ Churchill's	Ditto.
Dilating Bags, Complete Sets, Barnes'	Ditto.
Dilator, Uterine, Thompson's	Khrone & Sesemann.
„ „ Hemborough's	Ditto.
„ Antique	Dr. Robins.
„ Urethral, Simpson's	Maw & Son.
Ecraseur Wire Rope, Hicks'	Ditto.
Embryotome, Rizzoli's	Prof. Rizzoli.

	Presented by
Feeding Bottle, British	Mr. Cooper.
Forceps, Gayton's	Dr. Gayton.
„ Lazaréwitch's	Dr. Barnes.
„ Hennig's	Prof. Hennig.
„ de Poche Chassagny's	Dr. Chassagny.
„ Levy's	Lollini.
„ Antique (2 pairs)	Durrock.
„ Long, Radford's	Dr. Radford.
„ Long, ditto	Ditto.
„ Dr. Beattie's	Dr. Beattie.
„ Lovati's	Prof. Lazzati.
„ Foot (2 pairs), Rizzoli	Prof. Rizzoli.
„ Short do.	Ditto.
„ Long (2 blades), do.	Ditto.
„ „ (3 blades), do.	Ditto.
„ Greenhalgh's	Maw & Son.
„ Churchill's	Ditto.
„ Pajot's	Ditto.
„ Graily Hewitt's	Ditto.
„ Murphy's	Ditto.
„ Long, Sir J. Simpson's	Ditto.
„ Short, do.	Ditto.
„ Denman's	Ditto.
„ Uterine, Maw	Ditto.
Funis Replacer	Sir C. Locock.
Invalid's Drinking Glass, Cooper	Cooper.
Irrigateur, Equisier's	Maw & Son.
Metrotome, Greenhalgh's	Khrone & Sesemann.
„ do.	Maw & Son.
„ Routh's	Ditto.
„ Sir. J. Simpson's	Ditto.
Ovariotomy Clamp, Spencer Wells	Ditto.
„ Trocar Syphon, Spencer Wells,	Ditto.
„ „ Tubular, do.	Ditto.
„ „ Spring, do.	Ditto.
„ „ Spring, Weiss	Ditto.
Ovum Forceps	F. W. Dunne.
„ Rizzoli's	Prof. Rizzoli.

	Presented by
Pierce Membrane, Dubois'	J. R. Traer.
Pelvimeter, Rizzoli's	Prof. Rizzoli.
Perforator, Sir. J. Simpson's	Maw & Son.
„ Smellie's	Ditto.
„ Assalini's	Lollini.
„ Mann's	Khrone & Sesemann.
„ Rizzoli's	Prof. Rizzoli.
Pessary Elastic	Prof. Giordano.
„ Galvanic	Ditto.
„ Hodges' in Metal	Mr. Russell.
„ Duffin's	Maw & Son.
„ Zwanck's	Ditto.
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Polyptrite, Aveling's	Maw & Son.
Polypus Snare, Graafe's	Sir C. Locock.
„ Forceps	Maw & Son.
Scissors, Uterine, Maw's	Ditto.
Speculum, Antique	Prof. Breslau.
„ Bivalve	Maw & Son.
„ „	Ditto.
„ Trivalve	Ditto.
„ Duckbill.	Ditto.
Stethoscope (double)	Prof. Küneke.
Syringe Syphon, Higginson's	Maw & Son.
„ „ Kennedy's	Ditto.
„ „ Savory & Moore's	Ditto.
Tire-Tetes	Lollini.
„	Durrock.
„ Rizzoli's	Prof. Rizzoli.
Trivella, do.	Ditto.
Tuyau d'aspiration pour la Matrice,	Prof. Hennig.
Uterine Sound, Simpson's	Maw & Son.
„ „ Sims'	Ditto.
„ Stem, Intra-, Glass and Ebonite, Meadows'	Dr. Meadows.
Vectis (2 varieties)	Prof. Fabri.

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